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**UNITED STATES PATENT APPLICATION**

of

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for

**METHODS AND SYSTEMS FOR CONTROLLING  
AN EXERCISE APPARATUS USING A PORTABLE REMOTE DEVICE**

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UNITED STATES PATENT AND TRADEMARK OFFICE

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

This invention relates to exercise mechanisms and, more specifically, to systems and methods for providing a portable remote device capable of controlling the operation of the exercise mechanism while providing the exercising individual with motivational content.

### **2. Related Patent Applications**

This is a continuation-in-part application of co-pending patent application serial number 09/641,627, filed August 18, 2000 entitled "System For Interaction with Exercise Device" that is incorporated herein by reference. This application is also a continuation-in-part application of co-pending patent application serial number 09/496,560, filed August 18, 2000 entitled "Computer Systems and Methods For Interaction with Exercise Device" that is incorporated herein by reference. This is further a continuation-in-part application of co-pending patent application serial 09/641,220, filed August 18, 2000 entitled "Systems and Methods For Interaction with Exercise Device" that is incorporated herein by reference.

### **3. The Relevant Technology**

In an attempt to improve their health and physical conditioning, consumers are purchasing home exercise devices in record quantities. One common challenge with home exercise equipment is motivating the purchaser to use the device on a consistent and ongoing basis. Typically, many exercise devices involve repetitive actions, which can

1 quickly become tedious to a person exercising alone. By eliminating exercising  
2 consistency over a period of time, the exercising person is prevented from achieving fitness  
3 levels at the same rate as would be possible by maintaining a steady and continuous  
4 exercise schedule. To aid home users maintain an exercising schedule, many systems and  
5 methods have been developed to simulate the exercising activities and encouragement  
6 associated with a health club or other similar facility, while permitting the user to exercise  
7 in the comfort of the user's own home.

8 Typically, health clubs provide organized exercise classes and routines that involve  
9 a group setting, where an individual member of the class derives encouragement and  
10 motivation from other members of the group. Furthermore, while individuals exercise at a  
11 health club they are taught correct techniques for exercising, thereby reducing the  
12 possibility of being injured during an exercise program. For example, in recent years,  
13 there has been a rise in the popularity of "Spinning Classes," in which each participant  
14 operates his or her own stationery exercise cycle in a group setting, with a coach or  
15 instructor leading the group through a prescribed program or routine. The coach provides  
16 instructions as to technique and exercising performance, while also optionally varying the  
17 exercising program or routine on a per person basis. Similarly, with recent advances in the  
18 design of treadmills, it is possible to have "Treadmill Classes" wherein an instructor not  
19 only leads the group, but the instructor is also able to control the operation of the treadmills  
20 of all of the class participants from a single control panel.

21 As implied above, one primary disadvantage with group training at a health club is  
22 the inconvenience of traveling to and from the health club. Consequently, it would be a  
23 definite advancement in the art of home exercise equipment to provide the desirable  
24

1 benefits of group exercise in a home setting. Specifically, it would be an advance to  
2 provide greater motivation and encouragement to a user of home exercise equipment,  
3 thereby increasing the potential for consistency with an exercise schedule.

4 One type of system includes a videocassette recorder (VCR) or similar device  
5 coupled, via a hard wired connection, to an exercise machine, such as a treadmill. As an  
6 individual exercises on the treadmill, the VCR in synchronization with prerecorded  
7 audio/video presentations controls the speed and incline of the treadmill. Although this  
8 type of system provides some motivational content to the exercising individual there is no  
9 interactivity with a personal trainer or a manner to modify the exercise program or routine  
10 on a per individual basis. Further, the video playback equipment is typically maintained at  
11 a single location and hence the exercise equipment has to be in close proximity to the  
12 VCR.

13 Another system is disclosed in U.S. Patent No. 5,645,509, entitled "Remote  
14 Exercise Control System" that is incorporated herein by reference. Such a system  
15 discloses a remote exercise control system in which an exercise machine, such as a  
16 treadmill, remotely communicates via a communications module with an evaluation  
17 module located at a remote location. Signals indicative of the operating parameters of the  
18 treadmill are transmitted from the treadmill to the evaluation module, and control signals  
19 are transmitted from the remote evaluation module for controlling the operating parameters  
20 of the treadmill.

21 Although each of the above provides some advance to giving motivation and  
22 encouragement to an exercising individual, limitations still remain.



1 The present invention is directed to devices, systems, methods, programs, computer  
2 products, computer readable media, and modules for controlling one or more operating  
3 parameters of one or more devices by a portable device that receives programming from a  
4 remote communication device or system, such as the iFit website. The present invention is  
5 particularly well suited to devices that utilize one or more motors and/or other electrically  
6 driven actuators that control one or more operating parameters of a device, such as an  
7 exercise device.

8 In one embodiment, the present invention includes an exercise system that allows  
9 the user of an exercise mechanism to perform user specific or user non-specific exercise  
10 programs retrieved from a communication mechanism or system. The user can retrieve  
11 such programs whether or not the exercise mechanism upon which they are performing the  
12 exercise program can directly communicates with the communication system.

13 As discussed herein, the exercise device includes an exercise mechanism having a  
14 movable element for movement in performance of exercise by a user and is configured to  
15 enable a user to perform the exercise program. One example of such an exercise device is  
16 a treadmill, although a variety of different exercise devices may be employed. A number  
17 of operating parameters control the operation of the treadmill. For example, treadmills  
18 include speed and incline operating parameters that dictate how fast the movable element  
19 will move and the angular orientation of the movable element during the exercise program.

20 In some situations, these exercise devices are incapable of directly communicating  
21 with the store of exercise programs at the communication system. The present invention  
22 provides a portable system that facilitates communication between such exercise devices  
23 and the communication system. Additionally, the portable system can track the  
24

1 performance of the user and the exercise device during an exercise program, store such  
2 information, and upload the information to the communication system, where the  
3 information is analyzed to create feedback and exercise programs specific to the user.

4 Further, the portable device provides the user with a portable storage device for  
5 storing numerous different exercise programs, including motivational content and optional  
6 control signals. In this manner, a user can store multiple exercise programs for different  
7 exercise mechanisms accessible by the user. Therefore, the user can carry the portable  
8 system to various locations and have access to user specific or user non-specific exercise  
9 programs for differing exercise mechanisms. For instance, a user can store one exercise  
10 program for use with the user's home exercise mechanism, another exercise program for  
11 use during an outside exercise activity or program, and yet another exercise program for  
12 use with exercise mechanisms at a gym or spa.

13 The portable system of the present invention can have a variety of different forms.  
14 However, in one exemplary embodiment, a portable system, includes: (i) an audio delivery  
15 device configured to deliver an audio portion of the exercise program to a user; (ii) a  
16 sensing device capable of tracking one or more measurable parameters of the exercising  
17 user and/or the exercise device or mechanism; and (iii) a control device configured to  
18 communicate with the audio delivery device, the sensing device, the exercise mechanism,  
19 and the communication system.

20 The audio delivery device can include one or more speakers that direct the audio  
21 portion of the exercise program to the user. In one illustrative embodiment, the audio  
22 delivery device is a headset that can be worn by the user during performance of the  
23 exercise program. The audio delivery device can further include a sensor that tracks one or  
24

1 more measurable parameters of the exercising user. For instance, the headset can include a  
2 pulse sensor that tracks the users pulse via contact with the user's ear. In this manner, the  
3 audio delivery device of the present invention provides the functionality of delivering  
4 audio signals to the user and substantially simultaneously tracking the user's pulse, while  
5 being easy to wear and simple to operate.

6 The sensing device of the portable system can also track various measurable  
7 parameters of the exercising user. For instance, the sensing device can track the speed of  
8 the user and the distance traveled by the user during an exercise program. In this manner,  
9 the portable system can measure other parameters of the user during performance of an  
10 exercise program and optionally upload the same to the control device.

11 The control device is configured to download and upload data or information from  
12 the various devices, components, and/or modules of the exercise system. Specifically, the  
13 control device manages the delivery of exercise programs from the communication system  
14 to the exercise mechanism and the audio delivery device. Subsequently, the control device  
15 manages the uploading of sensed measurable parameters of the user, and optionally the  
16 exercise mechanism, to the communication system. Such uploading can result in the  
17 creation of new exercise programs that are based upon the sensed measurable parameters.

18 According to another aspect of the present invention, one or more of the various  
19 devices forming the portable system can be incorporated into one or more devices. For  
20 instance, the sensing device and a sensor in the audio delivery device can be integrated  
21 with the control device. In other configuration, portions of the sensing device and the  
22 audio delivery device are incorporated within the control device. Similarly, the control  
23 device can be incorporated into the sensing device and the audio delivery device.  
24

1           Consequently, the present invention facilitates the delivery of exercise programs,  
2 including motivational content and control signals, to a user. Such exercise programs aid  
3 the user with performing an exercise regime in a consistent manner and hence obtain a  
4 higher fitness level than is possible without the aid of motivational content. Further, the  
5 present invention provides a portable system that can be used to store such motivational  
6 content and optional control signals to allow the user to travel from location to location,  
7 while maintaining the capability of performing an exercise program following motivational  
8 content. Additionally, the portable system provides access to the communication system,  
9 such as the iFit website and obtain exercising instructions and information in a simple and  
10 efficient manner, even if the user's own exercise device or mechanism is incapable of  
11 directly accessing the communication system.

12           These advantages in addition to other objects and advantages of the invention will  
13 be set forth in the description which follows, and in part will be obvious from the  
14 description, or may be learned by the practice of the invention. The objects and  
15 advantages of the invention may be realized and obtained by means of the instruments and  
16 combinations particularly pointed out in the appended claims.



1 Figure 8 is a functional block diagram of a communication system of the exercise  
2 system of Figure 1;

3 Figure 9 is a functional block diagram of the treadmill and computer with  
4 associated translator box of Figure 1;

5 Figure 10 is a functional block diagram of the exercise system of Figure 1;

6 Figure 11 is a more detailed functional block diagram of the exercise system of  
7 Figure 10;

8 Figure 12 is a functional block diagram of the illustrative modules of the  
9 communication module;

10 Figure 13 is a flow diagram illustrative of process of gathering information through  
11 the login/registration module of Figure 12;

12 Figure 14 is a functional block diagram of illustrative modules of the audio  
13 program module of Figure 12;

14 Figure 15 a flow diagram illustrative of the process of selecting an audio program  
15 for a particular exercise device selected from those illustrated in Figure 14;

16 Figure 16 a functional block diagram of the illustrative modules and functions of  
17 the personal training module of Figure 12;

18 Figures 17A-D is flow diagrams representative of the processes a user performs  
19 using the competition module of Figure 12;

20 Figure 18 is a flow diagram representing the process of performing diagnostic on  
21 the treadmill of Figure 2 from a distant location;

22

23

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1 Figure 19 is a flow diagram representing the actions performed by the user and  
2 communication module to create audio and video programs in accordance with the  
3 teaching of the present invention;

4 Figure 20 is a functional block diagram of a master-slave system according to the  
5 teaching of the present invention.

6 Figure 21 is another exercise system according to the teaching of the present  
7 invention;

8 Figure 22 is a detailed representation of a portable system of the exercise system of  
9 Figure 21;

10 Figure 23 is a block diagram representation of the portable system of Figures 21  
11 and 22;

12 Figure 24 is a representation of an alternate embodiment of the control device of  
13 the present invention mounted in a cradle; and

14 Figure 25 is a representation of an alternate embodiment of a portion of the  
15 portable system of the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to devices that include one or more motors or other electrically driven actuators used to control one or more operating parameters of the device. While the invention will be described in the context of a motorized treadmill, it should be understood that the invention is not limited to any particular type of exercise device. To the contrary, the present invention can be readily adapted to any motorized device or any other device that utilizes motors, solenoids, or any other electrically driven actuators to control any operating parameter of the device, such as speed, resistance, incline, time, temperature, or other similar operating parameters. The term "device" or "devices" shall refer broadly to any type of apparatus that includes one or more stepper motors, solenoids, or other electrically driven actuators or controllers. Additionally, the term "exercise devices" shall refer broadly to any type of device that takes the form of an exercise machine, including, but not limited to, treadmills, exercise cycles, Nordic style ski exercise devices, rowers, steppers, hikers, climbers, and elliptical or striding exercise devices.

Depicted in Figure 1 is a representation of one illustrative system, designated by reference numeral 10, that may incorporate the novel features of the present invention, including various novel devices, hardware and software modules, and the like that may be remotely accessed and controlled in a real-time manner. As shown, one or more exercise mechanisms, such as a treadmill 12a-12n is in communication with one or more trainers at treadmill 20a-20n via a translator device 13 and a personal computer 14. The translator device 13 and personal computer 14 communicate with a network 16 that is a communication network that enables various hardware and software modules and devices

1 to communicate one with another. Network 16, therefore, may be a local area network  
2 (LAN), wide area network (WAN), wireless network, packetized network, real-time  
3 network, and the like. Network 16 facilitates communication of treadmill 12 with a live  
4 trainer on treadmill 20 and/or communication system 18 (e.g. a website). Communication  
5 system 18 assists communication between a user on treadmill 12 and either a live trainer  
6 on treadmill 20, or some other third party 21, as will be described in more detail  
7 hereinafter. Optionally, communication system 18 acts as a stored trainer or connects to a  
8 stored trainer.

9 The following discussion will be directed to only a single treadmill 12 and a single  
10 treadmill 20, however, it may be appreciated that a similar discussion may be had for  
11 multiple treadmills 12a-12n, 20a-20n. In addition, although only one of each element of  
12 system 10 is depicted, it may be appreciated by one skilled in the art that system 10 may  
13 have a mixture of both single and multiple elements, for example, at least one treadmill 12,  
14 20, translator device 13, personal computer 14, network 16, and communication system 18.  
15 Alternatively, one or more of the elements of system 10 may be eliminated or the  
16 functionality thereof incorporated within the structure and function of one or more of the  
17 other elements of system 10.

18 Similarly, although each of the elements of system 10 are shown separated one  
19 from another, it may be appreciated by one skilled in the art that the hardware and/or  
20 software elements of the present invention may be incorporated within two or more  
21 elements. For example, translator device 13 and personal computer 14 may be  
22 incorporated within treadmill 12. Similarly, the hardware and/or software elements of the  
23 communication system 18 may be incorporated within treadmill 20.  
24

1 As defined herein, the term "trainer" or "third party" 21 may include: (i) a live  
2 human being; or (ii) a stored trainer, such as a website, computer, optical media (e.g.,  
3 compact disk or digital video disk), visual media, or magnetic media (e.g., videotape,  
4 readable disk), an electronic monitoring system, dynamic computer readable instructions,  
5 interactive and/or dynamic software programs, computer readable instructions, and other  
6 media and hardware and/or software modules and components, whether or not the trainer is  
7 located at treadmill 20 or at some other location. In one embodiment, the third party is  
8 another trainer.

9 Generally, system 10 enables exercise programming with control signals to be  
10 transmitted from a trainer at treadmill 20, or alternatively from communication system 18,  
11 to a user at treadmill 12. As disclosed in U.S. Patent Serial No. 09/349,608 entitled  
12 "Systems and Methods for Providing an Improved Exercise Device with Motivational  
13 Programming," which is incorporated herein by reference, the programming may include  
14 motivational content and/or one or more control signals that may be used to control the  
15 operating parameters of treadmill 12 in real-time in an uninterrupted manner. The control  
16 signals may be synchronized with the motivational content and designed to control one or  
17 more operating parameters of the exercise device, such as the speed, incline, difficulty of  
18 exercise program, time, distance, and the like of an exercise program performed on  
19 treadmill 12.

20 As used herein, the term "motivational content" is used to broadly refer to any  
21 audio material, including dialog, narration, sound effects, and/or music, either alone or in  
22 combination with video material. In one embodiment of the present invention, the  
23 motivational content is stored in communication system 18 and includes an audio/video  
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1 presentation of a personal trainer and others engaged in a series of exercises of varying  
2 difficulty. In another embodiment of the present invention, the motivational content is a  
3 live-on-live, real-time exercise program presented by one or more personal trainers that is  
4 either specific to one particular user or alternatively broadcast or optionally "webcast" to  
5 any user that it may access communication system 18. In still yet another embodiment, the  
6 programming includes an exercise profile of the intensity of various exercise criteria, such  
7 as but limited to, speed, incline, or resistance of the exercise device, that is displayed  
8 continually or periodically to the user during the performance of the programming. In still  
9 yet another embodiment of the present invention, the user controls the period of when the  
10 exercise profile appears. One skilled in the art may appreciate that various other  
11 configurations of programming are applicable.

12 Generally, the second real-time signal may include both the motivational content  
13 and the control signals, whether or not such control signals are synchronized with the  
14 motivational content. Alternatively, the second real-time signal may include only the  
15 motivational content, other signals representative of measurable parameters of the exercise  
16 device (e.g. speed, inclination, resistance, etc) and/or a user of the exercise device (e.g.  
17 heart rate, blood pressure, etc), and the like. For example, treadmill 12 may transmit one  
18 or more signals to communication system 18. The signal may include parameters such as  
19 the status of the exercise device, e.g., active status (i.e., on), deactivated status (i.e., off),  
20 standby status (i.e., waiting), and the like, and/or parameters such as speed, inclination,  
21 resistance. Additionally, the signal may include parameters regarding the user, such as  
22 heart rate, blood pressure, and the like. Alternatively, treadmill 12 may receive  
23 programming "broadcast" by communication system 18 and/or a trainer at treadmill 20,  
24

1 such that any treadmill with the capabilities to receive the programming may access such,  
2 without the need to transmit one or more signals.

3 As mentioned above, the control signals control the operating parameters of  
4 treadmill 12, such as speed, inclination, resistance, and the like. Such control may be  
5 achieved by a trainer at treadmill 20, a combination of a trainer at treadmill 20 and  
6 communication system 18, or a third party 21 interacting with treadmill 20 and/or  
7 communication system 18. Generally, the present invention allows control of a device,  
8 such as an exercise device, without the need to interrupt the other portions of the  
9 programming, such as the real-time audio and/or video.

10 Figures 2 through 5 generally depict a typical motorized, reorienting treadmill 12.  
11 Although the discussion herein will be directed to treadmill 12, it may be appreciated by  
12 one skilled in the art that treadmill 20 may include all or a portion of the elements,  
13 modules, and means discussed herein

14 Treadmill 12, in one embodiment, includes a control panel 22 supported on a  
15 generally upright support structure 24 and a tread base 26. Upright support structure 24, in  
16 this illustrative embodiment, includes two side members 28, 30 coupled together by way of  
17 one or more cross members 32. Side members 28, 30 and cross members 32 may have  
18 various configurations and may be fabricated from various materials so long as they are  
19 capable of supporting control panel 22 and tread base 26. For example, the elements of  
20 upright support structure 24 may be fabricated from, but not limited to metals, plastics,  
21 composites, combinations thereof, and the like. Additionally, one skilled in the art may  
22 appreciate that various other exercise devices may have different upright support  
23  
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1 structures, side members, and cross members, or be devoid of one or more of such  
2 structures and members.

3 The tread base 26 typically includes a pair of side rails 34, 36 each having a front  
4 portion proximal to and a rear portion distal from upright support structure 24 when tread  
5 base 26 is in a downward exercisable position. As shown in Figure 4, a front pulley 38 and  
6 a rear pulley 40 are disposed between and supported by side rails 34, 36, while a  
7 continuous belt 42 extends between and around front and rear pulleys 38 and 40,  
8 respectively. Pulleys 38, 40 and belt 42 may have various configurations and be fabricated  
9 from various materials, as known by one skilled in the art and commonly known within the  
10 exercise industry.

11 A deck 44, commonly fabricated from wood, typically supports the upper run of  
12 belt 42 and supports an exercising individual resting upon belt 42. Although deck 44 is  
13 preferably of a cellulose material such as wood, various other types of material may be  
14 used so long as deck 44 is capable of supporting belt 42 and a user exercising thereupon.

15 As best seen in Figure 4, in one embodiment, front pulley 38 is mechanically  
16 coupled to an electric tread drive motor 46 by way of pulleys 48 and 50 and a drive belt 52.  
17 In this illustrative embodiment, motor 46 further incorporates an inertial flywheel 54 that  
18 controls fluctuations in the rotational motion of a shaft of motor 46 during operation of  
19 treadmill 12. Motor 46 is optionally electrically coupled to a treadmill controller 56 that  
20 controls the operation of motor 46, and thus the speed of belt 42, in response to various  
21 user inputs or other control signals. As shown, treadmill controller 56 is incorporated  
22 within tread base 26; however, it may be appreciated by one skilled in the art that treadmill  
23  
24

1 controller 56 may be incorporated within control panel 22 or alternatively within personal  
2 computer 14.

3 In addition to the ability to control and vary the speed of belt 42, treadmill 12 also  
4 permits the degree of incline of tread base 26 relative to the floor, or other surface upon  
5 which tread base 26 rests, to be varied. Typically, this is accomplished through the use of  
6 an incline drive motor 60 that rises or lowers one end of tread base 26 relative to the other  
7 end. In the embodiment illustrated in Figures 2 through 5, tread base 26 includes a pair of  
8 rear feet 62 and 64 that are rotatably attached to the rear of portion of side rails 34, 36. As  
9 best seen in Figures 4 and 5, feet 62 and 64 are mechanically coupled through a shaft 66 to  
10 incline drive motor 60, which causes feet 62 and 64 to pivot about their points of pivotal  
11 attachment to side rails 34, 36, thereby selectively raising or lowering the rear end of tread  
12 base 26 relative to the front end thereof. Motor 60 is also optionally electrically coupled  
13 to, and controlled by the treadmill controller 56.

14 As shown in Figure 2, treadmill 12 (and optionally treadmill 20) includes control  
15 panel 22 attached to side members 28, 30 of upright support structure 24. Control panel  
16 22, in one embodiment, as shown in Figure 6, includes one or more interface devices.  
17 Such interface devices may be either input devices or output devices. Input devices enable  
18 a user to input and vary the operating parameters of treadmill 12. As examples of such  
19 input devices, control panel 22 includes many typical controllers for use on an exercise  
20 device, such as a treadmill. A number of illustrative input devices include but are not  
21 limited to speed controls 68, incline controls 70, time controls 72, distance controls 74, a  
22 start button 76, a stop or pause button 78, and heart rate controls 80. In addition to these  
23 input devices, such as one or more controllers, control panel 22 further optionally includes  
24

1 an iFit.com button 82, a manual override button 84, and a scaling control 86, each of which  
2 are also examples of input devices. It may be appreciated that each of the above-recited  
3 controllers or buttons may be embodied in a variety of different manners to perform their  
4 commonly utilized function. In addition, each controller, button, and the like may take the  
5 form of one or more switches, rheostats, potentiometers, touch sensitive controls, voice  
6 activated controllers, and the like. The input devices described herein are examples of  
7 structures capable of performing the function of interface means for gathering a first signal  
8 (such as a real time signal) from the user. One skilled in the art may identify various other  
9 configurations of interface means that are capable of performing the desired function.  
10 Additionally, it may be appreciated that treadmill 20 may also include such interface  
11 means.

12 As shown in Figure 6, iFit.com button 82, in one embodiment, acts as both a  
13 selector and an indicator of connectivity of treadmill 12 to communication system 18, and  
14 optionally treadmill 20, whether such connectivity is via translator device 13, computer 14,  
15 or directly from treadmill 12. The iFit.com button 82 optionally includes an indicator light  
16 (not shown) that demonstrates when a connection has been established between treadmill  
17 12 and communication system 18, such as when iFit.com button 82 is depressed.  
18 Alternatively, a light emitting diode (LED) positioned in close proximity to iFit.com  
19 button 82 may be activated when iFit.com button 82 is activated.

20 The connection achieved by activating iFit.com button 82 may be via a variety of  
21 communication line connections. For example, as shown, control panel 22 includes a  
22 wireless port 105 that enables treadmill 12 to wirelessly communicate with network 16  
23 (Figure 1), either directly or via computer 14 and/or translator device 13. Alternatively,  
24

1 wireless port 105 may be located on tread base 26. Various other types of port or interface  
2 may be included within treadmill 12 to enable communication via one or more  
3 communication line connections. For example, treadmill 12 may include one or more  
4 ports and interfaces to enable communication line connection through existing broadcast  
5 technology, including television broadcast over the airwaves, cable or cable modems,  
6 satellite, telephone lines, whether analog or digitally based, the internet, DSL, G-Lite,  
7 wireless technology, infra-red (IR) technology, other high-speed data connections, or any  
8 other suitable transmission technology or medium. Optionally, a communication port on a  
9 user treadmill may enable communication directly with another treadmill (such as in a  
10 master/slave scenario), whether or not such communication utilizes a network.

11 In one embodiment, by activating iFit.com button 82, a user of treadmill 12, or  
12 other exercise device, connects to communication system 18, such as a website. Such  
13 connection may be via an independently located computer, such as computer 14, through  
14 translator device 13 or directly through a local area network (LAN) or wide area network  
15 (WAN) by way of the described communication line connections for example, or other  
16 connections known to one skilled in the art.

17 More specifically, by activating the iFit.com button 82 a signal is transmitted to  
18 communication system 18 to create a connection therebetween. In this manner, treadmill  
19 12 may receive signals representative of exercise programming from communication  
20 system 18. Additionally, the connection with communication system 18 enables the user  
21 to obtain the services of a stored trainer or a personal trainer to perform programming, ask  
22 questions, download or access programming materials, surf the web, gather and send  
23 electronic mail messages ("e-mail"), listen to audio programming, view video  
24

1 programming, review and update user information and statistics, load user statistics,  
2 purchase exercise programming, equipment, and materials, update exercise device software  
3 and operating parameters, research exercise materials, and the like.

4 Furthermore, activation of the connection with communication system 18 enables  
5 treadmill 12, or other exercise device, to have the potential of being controlled during an  
6 exercise program by a third party, whether that third party is another personal trainer using  
7 another treadmill 20, a stored communication system 18, or some other individual,  
8 hardware, or software modules or components. For example, a third party individual or a  
9 stored third party trainer may operate a console controlling the operation of one or more  
10 exercise devices in a group class setting, including devices operated by a live or stored  
11 trainer and by trainee users. This may be useful in a spinning class or other class in which  
12 a trainer trains trainee users. In one embodiment, as the third party controls the operation  
13 of the exercise devices, the trainer can communicate motivational messages to the trainee  
14 users.

15 Similarly, activation of the connection with network 16 and/or communication  
16 system 18 enables one or more users to interact one with another, and optionally compete  
17 one against another as shall be described in detail hereinafter. For example, a first user on  
18 treadmill 12a may receive information regarding the workout performed by a second user  
19 on treadmill 12n via network 16 and/or communication system 18, and then compete  
20 against the second user and vice versa. This competition may be live on live or time  
21 adjusted, e.g., a workout recorded previously by the second user, which the first user  
22 competes against. Greater information about communication system 18, with its associated  
23 modules and components will be discussed in detail hereinafter.

24

1 As mentioned above, control panel 22 may include manual override button 84.  
2 Manual override button 84 enables a user to override an action initiated by (i) a live trainer  
3 or (ii) a stored trainer, such as communication system 18, stored programming that is  
4 located within the memory of computer 14, or alternatively in memory stored in treadmill  
5 12. Upon activating manual override button 84, control of the operation of treadmill 12 is  
6 returned to the user. Consequently, the user may operate the manual controls of treadmill  
7 12, such as speed controls 68, incline controls 70, time controls 72, distance controls 74, a  
8 start button 76, and a stop or pause button 78 during the performance of an exercise  
9 program or regime. For example, if the exercise program accessed through communication  
10 system 18 is too difficult for the user, the user may activate manual override button 84  
11 thereby interrupting the program delivered to treadmill 12 by communication system 18  
12 and thereafter reduce the intensity of the exercise program through the user's manipulation  
13 of the speed controls 68, incline controls 70, time controls 72, distance controls 74, a start  
14 button 76, and/or a stop or pause button 78. Furthermore, in the event that the exercise  
15 program is too easy, the user may increase the difficulty level of the exercise device  
16 through one or more of speed controls 68, incline controls 70, time controls 72, and  
17 distance controls 74. Consequently, manual override button 84 provides the user with a  
18 safety switch during operation of treadmill 12. In an alternate configuration of treadmill  
19 12, the functionality of manual override button 84 is activated upon manual activation of  
20 one of the other input devices, such as but not limited to, incline controls 74, speed  
21 controls 76, stop/pause button 78, and the like.

22 Similar to the operation of manual override button 84, scaling control 86 enables a  
23 user to vary the operating parameters of treadmill 12 during an exercise program initiated  
24

1 externally to treadmill 12. A user may activate scaling control 86 and vary the intensity of  
2 an exercise program. The scaling control 86, therefore, enables a user to select a value  
3 representative of the proportional change to be made to the control signal received by the  
4 communicating mechanism of treadmill 12 from communication system 18. For example,  
5 if an exercise program requires a maximum speed of 6 miles per hour (mph) with a  
6 maximum incline of 15 degrees for a period of 30 minutes, an individual may activate  
7 scaling control 86 to require only 66% intensity of the exercise program; stated otherwise,  
8 reduce the intensity by one third. Therefore, the exercise program is varied to a maximum  
9 speed of 4 mph, with a maximum incline of 10 degrees, for a period of 20 minutes.  
10 Optionally, scaling control 86 may enable the user to set maximum values for each  
11 operating parameter of treadmill 12. In another configuration, scaling control 86 may  
12 enable the user to scale only one operating parameter of treadmill 12 while leaving other  
13 parameters unchanged. Hence, the user may vary the exercise program to their particular  
14 abilities, while obtaining the beneficial effects of exercising.

15 As another example of an input device of the present invention, control panel 22  
16 may include a diagnostic control 88. Upon activation of diagnostic control 88, whether by  
17 depressing a button or by some other manner known to one skilled in the art, treadmill 12  
18 communicates with communication system 18 to check the operating status of the exercise  
19 device. Communication system 18, thereby sends signals to the internal hardware and  
20 software modules of treadmill 12 to verify that the modules are operating within the  
21 desired specifications or to determine whether treadmill 12 may include software for which  
22 an update is available. In one embodiment, in the event that one or more of the hardware  
23 and/or software modules are damaged or not performing as required, communication  
24

1 system 18 may download one or more software updates from communication system 18 if  
2 possible. Alternatively, communication system 18 may inform the user that an error has  
3 occurred and advise that the user obtain maintenance of the hardware components of  
4 treadmill 12.

5 As additional examples of input devices, according to another aspect of the present  
6 invention, control panel 22 may include an audio input device 90 and a video input device  
7 92. Audio and video input devices 90, 92 enable a user to perform communication, such as  
8 real time communication, with other users of exercise devices, via communication system  
9 18 (Figure 1). The audio and video input devices 90, 92 also enable the user to hear and/or  
10 watch (i) a live trainer or (ii) a stored trainer, such as recorded programs, educational  
11 programming, entertainment programming, and the like. The diagnostic control 88, audio  
12 input device 90 and video input device 92, therefore, are structures capable of performing  
13 the function of interface means, communicating with the exercise mechanism, for  
14 gathering a first signal from the user. Various other configurations of such interface means  
15 are known to one skilled in the art in view of the teachings contained herein.

16 In one embodiment, audio input device 90 may take the form of a microphone,  
17 while video input device 92 may take the form of a video camera. Audio input device 90  
18 and video input device 92 may alternatively take various other configurations as known by  
19 one skilled in the art. For example, audio input device 90 may be a microphone detachable  
20 connected to control panel 22 or another part of treadmill 12. In another configuration,  
21 audio input device 90 may be located distant from treadmill 12, while being capable of  
22 gathering the audio inputs from the user. In still another configuration, audio input device  
23 90 may be eliminated from treadmill 12, while treadmill 12 includes an audio jack, such as  
24

1 an RCA-type audio jack, RJ-type jacks, digital audio jack, and the like. In still another  
2 configuration, audio input device 90 may be a radio frequency (RF), infra red (IR), or  
3 wireless type microphone. Similarly, video input device 92 may have the configuration of  
4 a digital video camera integrally formed within control panel 22. Alternatively, video  
5 input device 92 may be detachably connected to control panel 22 or another part of  
6 treadmill 12, such as wireless digital cameras. Still in another configuration, video input  
7 device 92 may be located distant from treadmill 12, while being capable of gathering the  
8 requisite video signals to be transmitted to communication system 18 (Figure 1).

9 In addition to the above-described audio and video input devices 90, 92  
10 respectively, control panel 22 may include a variety of other input devices. For example,  
11 control panel 22 may include an integrally formed mouse 100. Additionally, control panel  
12 22 may include a keyboard jack 102 for an external keyboard 103, a controller port 104 for  
13 receiving one of a variety of game controller, an integrally formed mouse 100, a touch-  
14 sensitive video display, and various other ports, jacks, or the like to receive various other  
15 external components. Each input device is adapted to allow a user operating treadmill 12  
16 to more fully operate one or more operating parameters of treadmill 12. Furthermore, the  
17 input devices enable the user to access communication system 18 and/or obtain educational  
18 information, entertainment information, or other information via network 16, whether such  
19 information is from communication system 18 or from one of a variety of other hardware  
20 and/or software modules that are accessible via network 16. For example, the input  
21 devices may allow the user to surf the Internet to find educational materials or  
22 entertainment. These additional input devices are further examples of are structures  
23  
24

1 capable of performing the function of interface means, communicating with the exercise  
2 mechanism, for gathering a first signal from the user.

3 Control panel 22, in one embodiment, includes one or more output devices that  
4 provide a visual and optionally an audio indication of the operational status of treadmill 12  
5 to the user. As with the input devices, the output devices may have various configurations  
6 and perform numerous functions. Generally, the output devices described herein are each  
7 structures capable of performing the function of means for reproducing a signal. The  
8 output devices and hence the means for reproducing a signal may have various  
9 configurations as known to one skilled in the art in view of the teaching contained herein.  
10 In one embodiment, each speed control 68, incline control 70, time control 72, distance  
11 controls 74, and heart rate control has an associated output device 68a, 70a, 72a 74a, and  
12 80a respectively. For example, each output device 68a, 70a, 72a 74a, and 80a may take the  
13 form of a numerical indicator, a graphical indicator, a combination of a numerical indicator  
14 and a graphical indicator, so long as such output devices 68a, 70a, 72a 74a, and 80a are  
15 capable of displaying and presenting one or more operating parameters of treadmill 12 to  
16 the user. The operating parameters can be depicted in past, current, and/or future status of  
17 treadmill 12.

18 In addition to the above output devices 68a, 70a, 72a 74a, and 80a, control panel 22  
19 can include output devices associated with start button 76 and stop or pause button 78. For  
20 example, the output device for start button 76 and stop or pause button 78 can take the  
21 form of an indicator 76a, which is illuminated when power is delivered to treadmill 12 and  
22 darkened when no power is delivered to treadmill 12. Further, start button 76 can be  
23 illuminated by one or more light sources when start button 76 has been depressed to cause  
24

1 treadmill 12 to operate, i.e., belt 42 to rotate and/or tread base 26 to raise or lower. Upon  
2 depressing stop button 78, the light illuminating start button 76 can be darkened, while  
3 optionally a light illuminating stop button 78 may be activated. Various manners by which  
4 a user is informed of the operating status of treadmill 12 are known to those skilled in the  
5 art in view of the teaching contained herein.

6 Control panel 22 may further include a video output device 94, such as a video  
7 display. Generally, video output device 94 presents the user of treadmill 12 with  
8 information and data transmitted from communication system 18, whether such data is live  
9 transmission from treadmill 20, or alternatively stored programming accessible by  
10 communication system 18. Additionally, video output device 94 may optionally show  
11 information and data from: (1) various other sources selected by the user, third parties, or  
12 system 10; (2) statistical information representative of the operational parameters of  
13 treadmill 12, such as the speed, incline, duration of user's workout, etc.; (3) electronic mail  
14 messages (e-mail), and the like. Video output device 94, in one embodiment is a liquid  
15 crystal display (LCD) or cathode ray tube (CRT) display.

16 One skilled in the art may appreciate that various other devices may be used to  
17 perform the functions of video output device 94. For example, video output device 94 may  
18 be an electroluminescent display (ELD), a gas-plasma display, a thin film transistor (TFT)  
19 display, a virtual reality (VR) display, and the like. In another embodiment of the present  
20 invention, control panel 22 includes multiple video output devices 94. In still another  
21 embodiment, video output device 94 is adapted to permit split screen or layered images  
22 that are associated with picture-in-picture viewing of various images and information. For  
23 example, video output device 94 may allow a user to watch various types of entertainment  
24

1 and/or surf the Internet, while receiving images representative of the exercise profile that  
2 they are following whether continuously, periodically, upon activation of a user control, or  
3 the like.

4 As shown in Figure 6, in one embodiment of the present invention, control panel 22  
5 includes an audio output device 96, such as a speaker. Audio output device 96 performs a  
6 similar function to that of video output device 94, in that audio output device 96 provides  
7 the user with audible signals representative of the operational parameters of treadmill 12.  
8 Additionally, audio output device 96 may deliver audio, visual, or control signals to the  
9 user from communication system 18 and treadmill 20. Such signals may be audible and/or  
10 inaudible signals transmitted from the trainer on treadmill 20. Various speakers are  
11 applicable and may operate as audio output device 96, for example, hardwired and wireless  
12 speakers, such as computer speakers, audio system speakers, and the like. Control panel  
13 22 may optionally include one or more amplifiers in cooperation with audio output device  
14 96. Furthermore, audio output device 96 may be circumvented through user of one of a  
15 variety of audio jacks that enable a user to listen to the audio output through headphones or  
16 similar audio transmitting device.

17 In addition to the output devices described above, the present invention may  
18 include various other output devices to provide information and data to the user of  
19 treadmill 12. In one embodiment of treadmill 12, control panel 22 includes one or more  
20 displays depicting one or more operating parameters of treadmill 12 and/or the  
21 communication link between treadmill 12, translator device 13, personal computer 14,  
22 network 16, communication system 18, treadmills 20a-20n, and/or third party 21. The one  
23 or more displays give a visual display of some of the more important exercise device  
24

1 operating parameters, such as but not limited to, speed, incline, distance traveled, calories  
2 used, elevation climbed, wheel resistance, and the like. The one or more operating  
3 parameter displays may use a numerical display, a graphical display, combinations thereof,  
4 or such other displays known to one skilled in that art. For example, the operating  
5 parameter display may be incorporated within video output device 94. Optionally, as  
6 discussed herein, the video output device 94 can act as an input device, such as when video  
7 output device 94 has a touch sensitive screen.

8 According to another aspect of the present invention, treadmill 12 can include  
9 multiple displays that present the same information to the user. For example, video output  
10 device 94 may display certain operating parameter information that is duplicative of  
11 operating parameter information represented by output devices 68a, 70a, 72a, 74a, 76a, and  
12 80a. Further, treadmill 12 can include multiple controls that enable a user to control the  
13 operation of treadmill 12 via different input devices. In this manner, in the event that  
14 communication between treadmill 12 and translator device 13, personal computer 14,  
15 network 16, communication system 18, treadmills 20a-20n, and/or third party 21 is  
16 interrupted, thereby potentially causing video output device 94, for example, to become  
17 blank and not present information to the user, allow the user to control the operation of  
18 treadmill 12 via video output device 94, or permit communication system 18 to control  
19 treadmill 12, a user can continue to view operating parameter information on control panel  
20 22 and continue to vary the operating parameters through manipulation of the various input  
21 devices included in control panel 22, such as speed controls 68, incline controls 70, time  
22 controls 72, distance controls 74, a start button 76, and a stop or pause button 78.  
23 Consequently, treadmill 12 can include many redundant controls and displays to allow a  
24

1 user to control treadmill 12 via different input devices and to view operating parameters  
2 through many output devices.

3 As shown in Figure 1, communicating with treadmill 12 via personal computer 14  
4 is communication system 18 and treadmill 20. Those skilled in the art will appreciate that  
5 computer 14 may take various configurations, including personal computers, hand-held  
6 devices, multi-processor systems, microprocessor-based or programmable consumer  
7 electronics, telephones, network PCs, minicomputers, mainframe computers, and the like.  
8 Additionally, computer 14 may be part of a distributed computer environment where tasks  
9 are performed by local and remote processing devices that are linked (either by hardwired  
10 links, wireless links, or by a combination of hardwired or wireless links) through a  
11 communications network, such as network 16. Furthermore, as suggested earlier, treadmill  
12 12 may optionally incorporate the functionality of personal computer 14 therein or include  
13 one or more modules or components of computer 14 while not incorporating all the  
14 modules and components of computer 14.

15 The following discussion will focus on certain examples of alternate structures that  
16 may be used as computer 14; however it is understood that a similar discussion may be  
17 made for the hardware and/or software modules and components associated with  
18 communication system 18, treadmill 20, and/or a third party 21. Furthermore, it may be  
19 appreciated that treadmill 12, treadmill 20, communication system 18 and third party 21  
20 may incorporate portions of computer 14 as described herein and appreciated by one  
21 skilled in the art in light of the teaching contained herein. Similarly, one skilled in the art  
22 will recognize that treadmill 12 and/or communication system 18 may include some or all  
23 of the modules and components of computer 14.  
24

1 Generally, computer 14 is configured to receive data from various portions of  
2 treadmill 12 and deliver manipulated data to the hardware and/or software modules or  
3 components associated with communication system 18 and/or treadmill 20 or other  
4 treadmills 12a-n. In addition, computer 14 communicates with communication system 18  
5 and retrieves audio, video, and control signals therefrom and provides these signals to  
6 treadmill 12, whether or not the signals are initiated solely by communication system 18,  
7 treadmill 20, a third party, or another treadmill 12a-12n. Computer 14 may, therefore, use  
8 various types of interfaces to communicate with treadmill 12 and network 16. For  
9 example, the interface may be a wireless interface thereby utilizing IR, RF, satellite, blue  
10 tooth transmission and associated protocols. Alternatively, the interface may be a modem,  
11 cable modem, ADSL connection, ISDN, Ethernet, or similar other connections, voice  
12 activated, and the like.

13 Following herein after is a general discussion of possible modules and components  
14 of computer 14. The following discussion is merely illustrative of modules and  
15 components that may form computer 14. It is appreciated that some of the referenced  
16 modules may be eliminated while other modules and components may be included within  
17 computer 14, as known by those skilled in the art.

18 With reference now to Figure 7, in one embodiment of the present invention  
19 computer 14 is a general-purpose-computing device, including a processing unit 110, a  
20 computer memory 112, and a computer bus 124 that couples various computer components  
21 including the computer memory 112 to the processing unit 110. The computer bus 124  
22 may be any of several types of bus structures including a memory bus or memory  
23 controller, a peripheral bus, and a local bus using any of a variety of bus architectures.  
24

1 Additionally, when treadmill 12 includes computer 14 and/or translator 13 computer bus  
2 124 may be an I<sup>2</sup>C bus, a SPI bus, a microwire bus, a microbus, and the like. Also,  
3 computer bus 124 may use the CAN protocol, CSAFE 1 protocol, or some other protocol  
4 known to one skilled in the art to allow communication between treadmill 12 and  
5 communication system 18 and/or treadmill 20 either directly or through network 16.

6 The computer memory, in this particular embodiment, includes read only memory  
7 (ROM) 126 and random access memory (RAM) 128. A basic input/output system (BIOS)  
8 130, containing the basic routines that help transfer information between elements within  
9 computer 14, such as during start-up, may be stored in ROM 126.

10 The computer 14 may also include a magnetic hard disk drive 132 for reading from  
11 and writing to a magnetic hard disk 138, a magnetic disk drive 134 for reading from or  
12 writing to a removable magnetic disk 140, and an optical disk drive 136 for reading from  
13 or writing to removable optical disk 142 such as a CD-ROM or other optical media. The  
14 magnetic hard disk drive 132, magnetic disk drive 134, and optical disk drive 136 are  
15 connected to computer bus 124 by a hard disk drive interface 144, a magnetic disk drive-  
16 interface 146, and an optical drive interface 148, respectively. The drives and their  
17 associated computer-readable media provide nonvolatile storage of computer-executable  
18 instructions, data structures, program modules, and other data for computer 14 as will be  
19 discussed in detail hereinafter. Although the exemplary environment described herein may  
20 employ a magnetic hard disk 138, a removable magnetic disk 140, and a removable optical  
21 disk 142, other types of computer readable media for storing data can be used, including  
22 magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, RAMs,  
23 ROMs, and the like.

24

1 Computer 14, in one embodiment, further includes program code means  
2 comprising one or more program modules that may be stored on hard disk 138, magnetic  
3 disk 140, optical disk 142, ROM 126 or RAM 128, including an operating system 150, one  
4 or more application programs 152, other program modules 154, and program data 156. A  
5 user may enter commands and information into computer 14, in one embodiment, through  
6 a keyboard 160, pointing device 162, or other input devices (not shown), such as but not  
7 limited to microphones, joy sticks, game pads, satellite dishes, scanners, video cameras,  
8 potentiometers, buttons, switches, rheostats, or the like, whether such devices are  
9 incorporated within treadmill 12 or in communication with translator device 13 and/or  
10 computer 14. These and other input devices are often connected to processing unit 110  
11 through a serial port interface 164 coupled to computer bus 124. Alternatively, the input  
12 devices may be connected by other interfaces, such as a parallel port, a game port, or a  
13 universal serial bus (USB), and the like. A monitor 166 or another video display device,  
14 such as those described herein is optionally connected to computer bus 124 via an  
15 interface, such as video adapter 168. In addition to the monitor, personal computer 14 may  
16 include other peripheral output devices (not shown), such as one or more speakers, and  
17 printers for obtaining recent statistical information regarding the user's workouts.

18 The computer 14, as depicted in this illustrative embodiment, may operate in a  
19 networked environment using logical connections to one or more remote computers, such  
20 as remote computer 170. The computer 14 may also communicate with treadmill 12 via a  
21 LAN and optionally communicate with communication system 18 and treadmill 20 via a  
22 WAN and optionally remote computer 170. Generally, each remote computer 170,  
23 communication system 18, and treadmill 12, 20 may be or include the structure and  
24

1 perform the function of another personal computer, a server, a router, a network PC, a peer  
2 device, or other common network node, and typically includes many or all of the elements  
3 described above relative to computer 14, although only one memory storage device 172  
4 and its associated application program 174 has been illustrated in Figure 7. The logical  
5 connections depicted in Figure 7 include local area network (LAN) 176 and a wide area  
6 network (WAN) 178 that are presented here by way of example and not limitation. Such  
7 networking environments are commonplace in office-wide or enterprise-wide computer  
8 networks, intranets and the Internet.

9 When used in a LAN networking environment, typically computer 14 is connected  
10 to the local network 176 through a network interface or adapter 180 that communicates via  
11 one of a variety of communication line connections, such as those described previously.  
12 When used in a WAN networking environment such that computer 14 may communicate  
13 with communication system 18, computer 14 may include a modem 182, a wireless link, or  
14 other means for establishing communications over the wide area network 178, such as the  
15 Internet. The modem 182, which may be internal or external, is connected to computer bus  
16 124 via serial port interface 164. In a networked environment, program modules depicted  
17 relative to computer 14, or portions thereof, may be stored in the remote memory storage  
18 device. It will be appreciated that the network connections shown are exemplary and other  
19 means for establishing communications over wide area network 178 may be used.

20 Various transmission or communication protocols may be used to enable computer  
21 14 to receive and transmit data through network 16. In one embodiment of the present  
22 invention, computer 14, and more specifically, network interface 180 or serial port  
23 interface 164, may use TCP/IP communication protocol. Alternatively, computer 14 may  
24

1 use connection orientated or connectionless networks via asynchronous transfer mode  
2 (ATM) technology, X.25 protocol, Frame Relay protocol, packet switching protocols,  
3 circuit switching protocols, dynamic packet switching protocols, 802.11RF protocol, home  
4 network protocols, CSAFE 1, CAN protocols, and the like to transmit and received data  
5 through network 16.

6 The term "transceiving" as used herein will mean transmitting, receiving, or a  
7 combination of both transmitting and receiving data. The term "packetized",  
8 "packetizing", and the like, as used herein will mean data that has been manipulated into  
9 one or more packets according to a packet switching protocol for transmission via network  
10 16, such as may be understood in light of the following teaching and knowledge within the  
11 art.

12 Generally, the packet contains the destination address in addition to the data. Each  
13 packet may be transmitted individually or may be combined or pooled with other packets  
14 of data going to similar destinations, such as audio data, video data and/or control signals.  
15 The packets of data or pooled data are optionally compressed and encapsulated for  
16 transceiving across network 16, where each packet may follow different routes to its  
17 destination. Once all the packets of a specific data message arrive at the destination, they  
18 are decompiled and deencapsulated into the original data. The packets may be prioritized  
19 according to content so that certain packets of data are delivered to computer 14, and hence  
20 treadmill 12, through network 16 faster than the other packets of data. For example, in a  
21 live-on-live exercise program situation audio and video data or signals are transceived  
22 faster than the control signals. Therefore, according to one embodiment, an individual may  
23 communicate with a trainer in real time without the need to interrupt the real-time  
24

1 communication between the trainer and the user so that one or more control signals may be  
2 delivered to the exercise device. An advantage of packetizing data, therefore, is that  
3 computer 14, translator device 13, and/or treadmill 12 may optimize its performance  
4 according to the available bandwidth of the communication connection line with network  
5 16 without the need to interrupt the real-time communication between a user and a trainer.

6 The discussion above describes a computer detached from treadmill 12; however,  
7 as appreciated and stated earlier, all or portions of computer 14 may be optionally  
8 incorporated within treadmill 12. As such, some or all of the various elements of computer  
9 14 may be incorporated within control panel 22, or alternatively within tread base 26. In  
10 various other configurations of the present invention, therefore, control panel 22 may  
11 include one or more magnetic hard disk drives, magnetic disk drives, optical disk drives,  
12 and associated interfaces. Control 22, therefore, may be capable of accessing programming  
13 that is stored on computer diskettes, CD ROMs, DVDs, and the like. Additionally, control  
14 panel 22 may optionally include a keypad integrally formed therein, or optionally include a  
15 standard keyboard interface that may enable a user to communicate with treadmill 12. The  
16 keypads and keyboard enable the user to control the operation of treadmill 12, and  
17 optionally communicate with communication system 18 and other hardware and/or  
18 software modules that may be accessible via network 16.

19 As depicted in Figure 1, computer 14 may optionally communicate with translator  
20 device 13 that is configured to manipulate signals transmitted and received between  
21 computer 14 and treadmill 12. Specifically, translator device 13 may be used when  
22 computer 14 and treadmill 12 are incapable of directly communicating one with another.  
23 Translator device 13 includes one or more processors that convert the signals passed  
24

1 therethrough to a form that the device to receive such signals might understand. For  
2 example, computer 14 may communicate with translator device 13 via a serial connection,  
3 while treadmill 12 may only communicate with devices that deliver data via a serial I<sup>2</sup>C  
4 connection or protocol. As such, translator device 13 is configured to manipulate the serial  
5 signal received from computer 14 into a signal capable of being delivered via a serial I<sup>2</sup>C  
6 connection or bus.

7 It may be appreciated by one skilled in the art that translator device 13 may convert  
8 various types of signal to various other forms capable of being transmitted to various  
9 interfaces. For example, translator device 13 may use a SPI bus, a microwire bus, a  
10 microbus, a CAN protocol, a CSAFE 1 protocol, a home network protocol, TCP/IP  
11 communication protocol, an asynchronous transfer mode (ATM) technology, X.25  
12 protocol, Frame Relay protocol, packet switching protocols, circuit switching protocols,  
13 dynamic packet switching protocols, 802.11RF protocol, serial, parallel, USB, or wireless  
14 connection, and the like. Additionally, the structure and function of translator device 13  
15 may be completely or partially incorporated within treadmill 12, computer 14, or a  
16 combination thereof.

17 Generally, computer 14 and/or translator device 13, collectively and/or individually  
18 are examples of a communicating mechanism, communicating with the interface means  
19 (e.g., the input devices of console 22 that gather a signal from the user). In one  
20 embodiment, the communicating mechanism enables real-time transmission of a first  
21 signal to: a live trainer (e.g., on treadmill 20), a stored trainer (e.g., communication system  
22 18), another user, or a third party 21, for example. The communicating mechanism may  
23 also receive a packetized second real-time signal from any of these sources.  
24

1 The second real-time signal may be an audio or visual signal directed to the user  
2 and/or a control signal directed to a device, such as an exercise device 12, for example.  
3 The audio and/or visual signal and the control signal may come from the same source, such  
4 as a trainer 20. In one embodiment, however, the second real time signal comprises an  
5 audio and/or visual signal from one source and a control signal from another source. For  
6 example, the audio and/or signal may come from a live trainer, while the control signal  
7 may come from a website or vice versa. Optionally, the audio, visual, and control signals  
8 are each directed both to the user and to the exercise device, such as when the control  
9 signal is an audible signal directed to a microphone connected to the device.

10 Computers 14 and/or translator device 13 portions are collectively or individually  
11 examples of a communicating mechanism. Additionally, when portions of one more  
12 computers 14 and/or translator devices 13 are incorporated within treadmill 12, such  
13 portions are collectively or individually examples of a communicating mechanism.  
14 Examples of such a communicating mechanism of the present invention may comprise (i) a  
15 single structure that enables transmission of the first signal and/or receives the packetized  
16 second signal or (ii) a first structure that enables transmission of the first signal and a  
17 separate second structure that receives the packetized second signal. Any of these  
18 communicating mechanisms are examples of structures capable of performing the function  
19 of communicating means, communicating with the interface means, for receiving a  
20 packetized second signal (such as a real time signal), and optionally, for enabling  
21 transmission of the first signal (such as a real time signal).

22 In one embodiment, the communicating means only receives the second signal.  
23 For example, upon merely activating a user input device, such as by turning the power of  
24

1 the exercise device or other device on, a first signal is "gathered from the user," but is not  
2 transmitted. Instead, the first signal merely activates the power and enables the  
3 communicating mechanism to receive any second packetized signal that may be broadcast  
4 to the exercise device. Such a broadcast may be from a communication system 18, such as  
5 by wireless transmission, RF transmission, or other means known to those skilled in the  
6 art. In another embodiment, the communicating mechanism transmits the first signal and  
7 receives the second signal.

8 Additionally, computer 14 and/or translator device 13, collectively and/or  
9 individually are examples of structures capable of performing the function of control  
10 means, communicating with the exercise mechanism, for receiving one or more packetized  
11 control signals from the communication system indicative of the selected exercise program  
12 and for changing one or more operating parameters of the exercise mechanism based upon  
13 the selected exercise program and the one or more packetized control signals.

14 As discussed above with respect to Figure 1, computer 14 may transceive one or  
15 more signals to and from communication system 18 through network 16. Referring now to  
16 Figure 8, a schematic block diagram of communication system 18 is illustrated. For  
17 simplicity, only the most relevant hardware components are illustrated in Figure 8. It may  
18 be appreciated by one skilled in the art that various other components may be included  
19 within communication system 18 depending on the particular use and function of  
20 communication system 18.

21 As depicted, communication system 18 includes an interface 190 that  
22 communicates with a control processor 192 and an interface 198. Interface 190 is  
23 configured to transceive one or more signals to and from computer 14 and treadmill 12 via  
24

1 network 16. Such signals may include audio and visual signals of the exercising user, the  
2 status of the exercise device, such as active status, deactivated status, standby status, data  
3 and information about the user, such as heart rate, blood pressure, and the like that has  
4 been gathered by one or more health monitoring devices. Such devices may include but  
5 are not limited to electrodes, transducer, other ECG monitoring devices, a pulse watch, a  
6 heart rate monitor, an EKG electronic detection device, an ECG electronic detection  
7 device, and the like. Similarly, interface 198 enables communication system 18 to transmit  
8 the above signals to and receive various signals from a trainer at treadmill 20 via network  
9 16 (Figure 1). Such received signals may include audio, visual, and/or control signals.  
10 Alternatively, the trainer at treadmill 20 may receive no signals, in the case where  
11 communication system 18 controls treadmill 12 without a trainer at treadmill 20.

12 Each interface 190, 198 therefore, may be of a variety of types depending on the  
13 particular communication line connection used in system 10 and the particular  
14 transmission protocols used by computer 14, treadmill 12, translator device 13, or treadmill  
15 20. For example, interfaces 190, 198 may be a wireless interface, may use infrared (IR),  
16 radio frequency (RF), microwave technology, satellite, blue tooth transmission, home  
17 network protocols, or various other protocols and technology as known by one skilled in  
18 the art. Alternatively, interfaces 190, 198 may be a modem, cable modem, ADSL  
19 connection, ISDN, Ethernet, or similar other connections. Interfaces 190, 198 either solely  
20 or in combination with the other elements of communication system 18, may use various  
21 transmission protocols to transceive data between treadmill 12 and treadmill 20 via  
22 communication system 18. It may be appreciated by one skilled in the art that interfaces  
23  
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1 190, 198 need not be the same, so long as they may communicate with control processor  
2 192, and the other appropriate elements of system 10.

3 Communicating with interface 190 and interface 198 is a control processor 192.  
4 Control processor 192 is configured to transceive signals through interface 190 and  
5 manipulates the same based on selected programming selected by: (i) the user; (ii) a trainer  
6 located at treadmill 20; (iii) a third party; or (iv) a combination thereof. Subsequently,  
7 control processor 192, optionally in combination within interface 190 or 198, prepares the  
8 selected programming (i.e., audio and video signals with associated control signals, if any)  
9 for transmission to treadmill 12 and 20. Control processor 192 also preferably "packetizes"  
10 the programming so that packets of information may be "streamed" or downloaded  
11 through respective interfaces 190, 198 to computer 14, and subsequently treadmill 12, or to  
12 treadmill 20. Each packet of data may sent individually, and may follow a different path  
13 across network 16 to reach computer 14 (or treadmill 12). Upon reaching computer 14 (or  
14 treadmill 12 or 20), the data may be "buffered" so that the data may be delivered to the  
15 user or trainer in real-time.

16 Generally, control processor 192 may include one or more micro-controllers,  
17 central processing units, state machines, programmable logic arrays, network logical  
18 arrays, or gates, ASIC processors, software-based controllers, combination logic,  
19 combinations thereof, and a variety of other controllers known by one skilled in the art to  
20 manipulate data transceived between treadmill 12, communication system 18, and/or  
21 treadmill 20.

22 Control processor is one example of a structure capable of performing the function  
23 of means for synchronizing and packetizing the controls signals with the programming and  
24

1 delivering the packetized control signal to the user device. It may be appreciated that  
2 various other control processors and means are appropriate and known to those skilled in  
3 the art.

4 Communicating with control process 192 is memory 194 and external memory 196.  
5 As shown, external memory 196 is optionally included, depending on the particular data  
6 storage needs of communication system 18. For example, memory 194 and/or external  
7 memory 196 may include physical information regarding the operation of treadmill 12.  
8 Additionally, memory 194 and/or external memory 196 may be one structure capable of  
9 performing the function of storage means for storing programming. Memory 194 and/or  
10 external memory 196 may, therefore, include or be configured to access one or more  
11 audiocassette tapes, compact disks (CDs), mini disks (MDs), computer diskettes,  
12 videotapes, laser disks (LDs), digital videodisks (DVDs), computer diskettes, or such other  
13 media capable of storing audio and/or video programming, with associated control signals.  
14 Additionally, memory 194 and/or external memory 196 may store a particular set of  
15 control signals in synchronization with the above-recited audio and video media  
16 programming. In light of the teaching contained herein, it may be appreciated by one  
17 skilled in the art, that either memory 194 and/or external memory 196 may take the form of  
18 or include a database structure that enables access to the various programming stored  
19 therein.

20 Also communicating with control processor 192 is control signal generator 200.  
21 Control signal generator 200 includes circuitry and/or software to generate the control  
22 signals that are synchronized with the audio and video programming retrieved from  
23 memory 194 and/or external memory 196 or alternatively transmitted from treadmill 20  
24

1 through interface 198. Therefore, control signal generator 200 may include one or more  
2 micro-controllers, central processing units, state machines, programmable logic arrays,  
3 network logical arrays, or gates, ASIC processors, software-based controllers, combination  
4 logic, combinations thereof, and a variety of other controllers known by one skilled in the  
5 art to generate one or more control signals.

6 Control signal generator 200 is one structure capable of performing the function of  
7 means for generating one or more control signals. One skilled in the art may identify  
8 various other configurations of means for generating one or more control signals.

9 Various configurations are applicable for encoding a control signal on a carrier  
10 signal included with the audio and video programming. Following hereinafter is a  
11 discussion of one format for encoding the control signals will now be discussed. It should  
12 be understood that the method of encoding set forth herein is representative only and is not  
13 intended to limit the scope of this invention or to limit the various other alternative means  
14 or methods by which a control signal may be transmitted to treadmill 12 and/or optionally  
15 treadmill 20. Additionally, any number of encoding schemes, which are known to those  
16 skilled in the art, may be used to carry out the desired function and are encompassed  
17 within, the scope of the present invention.

18 In one embodiment, the control signals generated by control signal generator 200  
19 are carried on a two (2) kHz carrier signal, with each control signal consisting of two  
20 transmission bursts, each burst having three bytes of data. The second burst is intended to  
21 exactly duplicate the first burst for error checking purposes. The first byte of data of each  
22 burst, generated by control signal generator 200, in this illustrative embodiment, indicates  
23 the desired speed of the treadmill, while the second byte of data indicates the desired  
24

1 incline of the tread base 26, and the third byte is a check sum of the first and second bytes.  
2 For other exercise devices the first and second bytes may represent other operating  
3 parameters, like resistance of an elliptical device or cycle device. It may be appreciated  
4 that each burst may include less or more than 3 bytes of data, depending on the different  
5 type of device that communicates with communication system 18. As configured, the  
6 control signal uses a standard RS-232 protocol. Alternatively, control signals may also use  
7 other serial or parallel protocols, such as RS-422, RS-423, universal serial bus (USB) and  
8 various other communication protocols known by one skilled in the art in light of the  
9 teaching contained herein.

10 In one embodiment, each control signal includes both the first burst and the second  
11 burst. Generally, the control signal is typically left in one quarter second in duration. Each  
12 byte consists of eight bits of data, giving a high degree of resolution for controlling the  
13 exercise device operating parameters, such as treadmill speed and the degree of incline. In  
14 one embodiment, each time a control signal is inserted into the programming, the control  
15 signal entirely suppresses the audio portion of the programming for the duration of the  
16 control signal. Alternatively, and more preferably, the control signal does not entirely  
17 suppress the audio portion of the programming. Rather the control signal is overlays the  
18 programming so that the programming is uninterrupted. As a result, the control signals are  
19 audible to the user which also provides an audible cue or warning to the user that one or  
20 more operating parameters of treadmill 12 is about to change. Alternatively, the control  
21 signals are inaudible to the user, but may be analyzed by computer 14 and/or treadmill 12.  
22 The inaudible signals may, therefore, dictate an additional or alternate manners by which  
23 the user is signaled of an impending change in one or more operating parameters of  
24

1 treadmill 12. For example, in addition to an audio signal, the control signal may include a  
2 video signal, such as a flashing red border that may appear around the exterior perimeter of  
3 the video output device 94 and overlap the video display to inform the user of a change in  
4 operating parameters of treadmill 12. It may be appreciated by one skilled in the art that a  
5 combination of both audio and video indicators, whether or not the programming is  
6 modified, such as the audio being eliminated, or the video being eliminated, may be used  
7 to inform the user of an impending change in operating parameters.

8 As alluded to above, the control signals are detectable by computer 14 or treadmill  
9 12, that verifies the control signal has the proper 2 kHz carrier frequency, checks to make  
10 sure that the control signals otherwise properly formatted, and check for errors. If the  
11 signal is approved, the signal is delivered to the appropriate controllers for varying the  
12 operating parameters of treadmill 12.

13 Generally, the operation of communication system 18 varies depending on the  
14 particular manner by which the programming is to be delivered to user on treadmill 12. In  
15 one configuration, treadmill 20 is similarly configured to treadmill 12, previously  
16 described. In such a case, when an individual wishes to perform an exercise program in  
17 real-time with a distantly located trainer training on treadmill 20, the trainer, preceding the  
18 scheduled exercise time, accesses or "logs on" to communication system 18. Upon  
19 logging onto communication system 18, the trainer prepares the desired exercise program  
20 or alternatively selects a stored control signal profile that is synchronized to the desired  
21 program from memory 194 and/or external memory 196. At the scheduled time for a live-  
22 on-live treadmill exercise program, both the user of treadmill 12 and the trainer located at  
23 treadmill 20 accesses communication system 18. The trainer activates the control signal  
24

1 profile, which is delivered to control processor 192. Control processor 192 delivers to both  
2 treadmill 12 and treadmill 20 both the audio and/or video programming and the desired  
3 control signals to vary the operating parameters of each treadmill 12, 20 in synchronization  
4 with the audio and/or video programming. Control processor 192, optionally in  
5 combination with interfaces 190, 198 prepares, the control signals with the audio and video  
6 signals in accordance with the communication protocol that computer 14, translator device  
7 13, treadmill 12 and/or treadmill 20 uses. Alternatively, control processor 192 may deliver  
8 control signals to treadmill 12 to vary the operating parameters thereof, while sending an  
9 audio and/or video representation of the exercise profile (i.e., speed, distance, time,  
10 inclination of the exercise device) of the exercise program delivered to the user, so that the  
11 trainer may then manually vary the operating parameters of treadmill 20 as desired. The  
12 delivery of the programming including the control signal may be termed a packetized  
13 second signal (preferably a packetized second real time signal).

14 In one embodiment, changes made by the trainer on treadmill 20 are translated into  
15 control signals that are delivered to treadmill 12 to vary the operating parameters therein.  
16 As such, treadmill 20 includes one or more sensors that identify changes made to the  
17 operating parameters of treadmill 20 and deliver signals representative of such changes to  
18 control processor 192. Upon receiving the sensed information, control processor 192  
19 delivers a request to control signal generator 200. Control signals generator 200  
20 subsequently generates a control signal associated with the actions taken by the trainer on  
21 treadmill 20 and passes those signals through control processor 192, interface 190, and  
22 optionally computer 14 to treadmill 12. The delivery of the programming including the  
23  
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1 control signal may be termed a packetized second signal or a packetized second real time  
2 signal.

3 In still yet another configuration, treadmill 20 is configured to include control  
4 signal generator 200. In this particular configuration, as a trainer performs a programming  
5 workout, whether such programming is stored on treadmill 20 or alternatively accessed  
6 through communication system 18, control signal generator 200 creates the bursts of bytes  
7 in accordance with changes made by trainer made on treadmill 20. As such, the control  
8 signals are sent from treadmill 20 through interface 198 to control processor 192. Control  
9 processor 192 then passes the control signals along with the audio and video programming,  
10 through interface 190 to treadmill 12. The delivery of the programming including the  
11 control signal may be termed a packetized second signal (preferably real time).

12 It may be appreciated by one skilled in the art, that the various above-described  
13 configurations are only illustrative of the manner by which treadmill 20 may control the  
14 operation of treadmill 12 either directly or alternatively indirectly through the use of  
15 control signal generator 200 and the other components and modules of communication  
16 system 18.

17 Following hereinafter, and depicted in Figure 9, is a functional block diagram of  
18 one embodiment of treadmill 12. In this particular configuration, the functionality of  
19 personal computer 14 is not incorporated within treadmill 12; however, as may be  
20 appreciated by one skilled in the art, computer 14 may be incorporated within control panel  
21 22 or other portions of treadmill 12. This embodiment enables true interactive  
22 communication between a user operating treadmill 12 in his or her own home, and a  
23 personal trainer located at a remote location, such as where treadmill 20 is located.  
24

1 Additionally, the trainer may observe the user in real-time and control the user's treadmill  
2 12 remotely and in real-time via communication system 18 without interrupting the real-  
3 time audio and video programming.

4 As shown, treadmill 12 includes control panel 22 and treadmill controller 56.  
5 Although shown separated, it may be appreciated that portions of each may be combined  
6 together, thereby simplifying the modules and components of the present invention.  
7 Control panel 22, in this embodiment, incorporates audio input device 90 in the form of a  
8 microphone and a video input device 92 in the form of a video camera for gathering audio  
9 and video signals to be transmitted to communication system 18. As mentioned  
10 previously, the audio and video receivers need not be incorporated within control panel 22  
11 or other portion of treadmill 12. Rather, audio input device 90 and video input device 92  
12 may be located distant from treadmill 12, while having sufficient detection controls to  
13 receive the requisite audio and video signals.

14 Signals from audio input device 90 and video input device 92 are delivered to an  
15 audio/video controller 212. Audio/video controller 212 is configured to manipulate the  
16 audio and video signals received from input devices 90, 92 in preparation for transmission  
17 to a processor 214. Audio/video controller 212, therefore, includes one or more amplifiers,  
18 micro-controllers, central processing units, state machines, programmable logic arrays,  
19 network local logical arrays, or gates, ASIC processors, software based controllers,  
20 combination logic, or combinations thereof to both manipulate audio and video signals that  
21 are to be transmitted or received by input devices 90, 92 and associated output devices 94,  
22 96. Additionally, audio/video controller 212 may include memory, such as a buffer, to  
23 store and aid with real-time transmission and delivery of the audio and video signals. It  
24

1 may be appreciated by one skilled in the art that various audio/video controllers 212 are  
2 applicable and known in the art in light of the teaching contained herein.

3       Communicating with audio/video controller 212 is processor 214. Processor 214  
4 converts the audio and video data received through audio/video controller 212 into the  
5 desired form that is capable of being transmitted to communication system 18 via  
6 communication interface 210. As such, processor 214 may perform various operations on  
7 the data to be delivered to communication system 18, such as but not limited to, packing,  
8 encrypting, splitting, and the like. Additionally, processor 214 may be configured to  
9 perform various operations to data received from communication system 18, such as but  
10 not limited to the reverse of the above operations. Generally, processor 214 may have  
11 various configurations to perform the above-described function as known by one skilled in  
12 the art. For example, processor 214 may take the form of one or more micro-controllers,  
13 central processing unit (CPU), state machines, programmable logic arrays, or network of  
14 logical gates, ASIC processor, software-based controllers, a combination of these  
15 components, or a variety of other controllers.

16       According to another aspect of the present invention, processor 214 may receive  
17 various inputs from one or more manually operated input devices 216, such as manual  
18 override button 84, scaling controls 84, and other controls and buttons known to one  
19 skilled in the art in light of the teaching contained herein. In response to such inputs,  
20 processor 214 may vary the operating parameters of treadmill 12 and provide the user with  
21 notification of such changes in the operating parameters of treadmill 12 via output devices  
22 218 and/or video output device 94 and audio output device 96. Processor 214, therefore, is  
23 one structure capable of performing the function of means for controlling the operating  
24

1 parameters of the exercise mechanism in real-time and one structure capable of performing  
2 the function of control means for receiving one or more packetized control signals from a  
3 communication system indicative of a selected exercise program and changing one or more  
4 operating parameters of the exercise mechanism based upon the selected exercise program  
5 and the one or more packetized control signals.

6 Communicating with processor 214, in one embodiment, is communication  
7 interface 210 that enables treadmill 12 to transceive data, such as packetized data, via a  
8 communication line. Communication interface 210, in one embodiment, is a modem.  
9 Depending on the particular communication manner used to communicate with  
10 communication system 18, different communication interfaces 210 may be used at  
11 different communication line connections. For example, the communication line  
12 connection may include existing broadcast technology, including television broadcast over  
13 the airwaves, cable or cable modems, satellite, telephone lines, whether analog or digitally  
14 based, the internet, DSL, G-Lite, wireless technology, other high-speed data connections,  
15 or any other suitable transmission technology or medium. As such, communication  
16 interface 210 is compatible with existing conventional broadcast technologies and can  
17 interface with existing audio and/or video components commonly found in homes, thereby  
18 reducing the overall cost of the exercise device and reducing barriers to accessing  
19 communication system 18.

20 Communicating with processor 214 and optionally communicating with  
21 communication interface 210 is treadmill controller 56. As illustrated in Figure 9,  
22 treadmill controller 56 communicates with control panel 22. Generally, treadmill  
23  
24

1 controller 56 may communicate with control panel 22 by an I<sup>2</sup>C bus, a SPI bus, a  
2 microwire bus, a microbus, and the like.

3 In one embodiment, treadmill controller 56 includes a treadmill processor 220,  
4 memory 222, and a control signal decoder 224. Treadmill processor 220 is configured to  
5 control the operation of speed motor 226 and incline motor 228 that controls the speed and  
6 incline of treadmill 12. Treadmill processor 220, therefore, is one structure capable of  
7 performing the function of means for controlling the operating parameters of the exercise  
8 mechanism in real-time and one structure capable of performing the function of control  
9 means for receiving one or more packetized control signals from a communication system  
10 indicative of a selected exercise program and changing one or more operating parameters  
11 of the exercise mechanism based upon the selected exercise program and the one or more  
12 packetized control signals.

13 Treadmill processor 220 is optionally controlled by processor 214 or by control  
14 signal decoder 224 in response to the various signals received through communication  
15 interface 210 from communication system 18. Alternatively, treadmill processor 220 may  
16 be controlled by signals obtained from memory 222, via input devices 216, audio input  
17 device 90 and video input device 92. Treadmill processor 220 may include various  
18 components and modules to perform the desired function. For example, treadmill  
19 processor 220 may include one or more micro-controllers, central processing unit (CPU),  
20 state machines, programmable logic arrays, or network of logical gates, ASIC processor,  
21 software-based controllers, combination logic, a combination of these components, or a  
22 variety of other controllers.

1 Controller 212, processor 214, interface 210, and treadmill processor 220 are  
2 collectively and individually examples of structures capable of performing the function of  
3 communicating means, communicating with the interface means, for receiving a  
4 packetized second signal, and optionally, for enabling transmission of the first signal.

5 Both processor 214 and treadmill processor 220 are capable of receiving and  
6 transmitting feedback signals from the various elements of treadmill 12, for example, feed  
7 back from drive motor 226 and incline motor 228. Each processor 214, 220 is capable of  
8 converting the feedback signals into signals for the video output device 94 or monitor 166  
9 communicating with computer 14. The particular feedback signals received from speed  
10 motor 226 and incline motor 228 may be stored in registers or memory modules.

11 Treadmill 12, as depicted, optionally includes one or more sensors, such as belt  
12 speed sensor 230 and incline sensor 232. Each sensor 230, 232 gathers a particular  
13 operating parameter of treadmill 12 (speed of belt 42 (Figure 4) and incline of tread base  
14 26), such that control panel 22 may present outputs via the output devices that are  
15 indicative of the present operating state of treadmill 12 at any given point in time.  
16 Treadmill 12 can include various other sensors that track the operating parameters of the  
17 treadmill. For instance, sensors to track (i) ampere draw by speed motor 226, incline  
18 motor 228, control panel 22, and the like; (ii) tension of belt 42; (iii) thickness of the wear  
19 layer of belt 42; (iv) number of hours treadmill 12 has operated; (v) equivalent number of  
20 miles for which treadmill 12 has been used; (vi) number of hours remaining before  
21 scheduled maintenance based upon usage and/or past maintenance date; (vii) treadmill  
22 power usage; (viii) operating status and efficiency of the various components of treadmill  
23 12; (ix) weight of the user to allow processor 214 and/or treadmill processor 220 to vary  
24

1 the operating parameters of treadmill 12 to accommodate heavier users; (x) voltage input  
2 and output to circuit boards and power boards upon which various components of treadmill  
3 12 are installed; (xi) and the like.

4 Similarly, treadmill 12 may includes other sensors that gather various other  
5 operating parameters, such as but not limited to, maximum pulse and heart rate, average  
6 pulse and heart rate, target heart rate, length of workout session, and the like.  
7 Additionally, sensors 230, 232, optionally in combination with one or more other sensors,  
8 may determine whether an individual is actually exercising on treadmill 12 and deliver a  
9 feedback signal to processor 214 that informs communication system 18 and/or the trainer.  
10 Furthermore, sensors 230, 232, optionally in combination with one or more other sensors,  
11 may calculate whether the individual is a juvenile and stop treadmill 12 in the event that  
12 the user is a juvenile.

13 As implied above, since processor 214 and optionally treadmill processor 220 can  
14 communicate with communication system 18, thereby allowing treadmill 12 to  
15 communicate with communication system 18, any sensed operating parameters of  
16 treadmill 12 or the exercising user can be uploaded to communication system 18 for  
17 analysis and storage. Subsequently, communication system 18, whether automatically or  
18 with the aid of a trainer or other personal can analyze the data and provide feedback to the  
19 user of treadmill 12. For instance, when a scheduled maintenance date approaches,  
20 communication system 18 can provide a warning to the user through video output device  
21 94 or via some other manner, such as e-mail or a letter. Similarly, in a gym or spa setting,  
22 communication system 18 can inform the owner or operator of the gym or spa of pending  
23 maintenance problems with specific exercise devices, such as the wear layer thickness  
24

1 becoming too small, while optionally scheduling such maintenance for the particular  
2 exercise device. In this manner, treadmill 12 can be remotely monitored by  
3 communication system 18.

4 As discussed earlier, system 10 enables a user of treadmill 20 to communicate with  
5 and control one or more operating characteristics or parameters of treadmill 12. There are  
6 various manners by which treadmill 12 may be controlled by communication system 18  
7 solely or in combination with treadmill 20 or a third party, such as those just mentioned  
8 above. Following hereinafter is a continued discussion of the operation of the illustrated  
9 embodiment of treadmill 12 depicted in Figure 9.

10 During operation of treadmill 12 a user initially inserts a dead-man key (not shown)  
11 within port 98 of control panel 22 (Figure 6). Upon insertion of the dead-man key,  
12 treadmill 12 is capable of being operated, i.e., power is allowed to flow to the various  
13 internal and external components of treadmill 12 and treadmill 12 has an active status.  
14 Once activated, a user may optionally connect to communication system 18 or use a stored  
15 or manually defined exercise program or workout. In the event that the user wishes to  
16 connect to communication system 18, in one embodiment, a user activates iFit.com button  
17 82 (Figure 6), thereby initiating the hardware and/or software modules within either  
18 treadmill 12 or computer 14 to create a connection with communication system 18.  
19 Alternatively, upon placing treadmill 12 in active status, treadmill may automatically  
20 connect to communication system 18.

21 Once a link is achieved and a user optionally has provided password and user  
22 identification, a user may select either stored or live-on-live exercise programs. Following  
23 the user selection, programming, whether live or stored is delivered (optionally in real  
24

1 time) to communication interface 210 via one or more of a variety of communication line  
2 connections, whether such connections are digital, analog, serial, parallel, or a combination  
3 thereof. The particular configuration of communication interface 210 may vary based  
4 upon the particular communication line connection used.

5 It may be appreciated by one skilled in the art that the exercise program may be  
6 displayed to the user in a variety of manners, depending on the particular signals received  
7 from communication system 18 or trainer device 20. For example, the programming may  
8 include an exercise profile that periodically or continually appears on video output device  
9 94. Alternatively, the programming may solely include the above-described exercise  
10 profile, thereby enabling the user of treadmill 12 to view educational or entertainment  
11 programming via video output device 94 during their exercise program.

12 Upon receiving the programming, communication interface 210 may optionally  
13 deliver the audio signal to control signal decoder 224 that identifies the control signal. In  
14 another setting, communication interface 210 may deliver both the audio and video signals,  
15 with the control signal, to processor 214 for manipulation and distribution to the  
16 appropriate hardware components, and/or software modules. Such delivery of  
17 programming may be performed through use of a general-purpose bus or a variety of other  
18 buses and protocols, such as an I<sup>2</sup>C bus, SPI bus, Microwire bus, Microbus, CAN protocol,  
19 home network protocol, or the like. Additionally, the control signals, and the audio and the  
20 video signals may be delivered using the CSAFE 1 protocol or equivalent thereof for  
21 various other types of device not within the field of exercise devices.

22 When communication interface 210 delivers all signals to processor 210, processor  
23 214 separates the audio, video, and control signals and optionally delivers them to  
24

1 audio/video controller 212, control signal decoder 224, treadmill processor 220, or  
2 memory 224. For example, in one configuration processor 214 may optionally deliver  
3 portions of the audio and video signals control signal decoder 224, either directly or  
4 through treadmill processor 220 such that the audio and video signals are “buffered” in  
5 accordance with “streaming” technology. If the available bandwidth does not allow real-  
6 time streaming of audio and video signals, video frames and the audio signals may be  
7 separated and transceived so that a segmented display is provided with real-time audio  
8 signals. Although segmenting of video frames is not preferred it is one possible  
9 alternative method of streaming audio and video signals. In another configuration, upon  
10 receiving the signals from processor 214, control signal decoder 224 may optionally store  
11 the complete audio and video signals for an entire program before treadmill 12 may access  
12 such signals. In yet another configuration, processor 214 may optionally deliver only the  
13 audio signal and the control signal to treadmill processor 220 that may include the  
14 functionality of control signal decoder 224 therein. The particular manner by which  
15 treadmill processor 220 retrieves either the encoded control signal or the decoded control  
16 signal may vary from configuration to configuration depending on the particular form of  
17 treadmill 12.

18 Generally, control signal decoder 224 either individually or collectively with  
19 processor 214 and/or treadmill processor 220 is one structure capable of performing the  
20 function of means for decoding the control signal having an input and an output. One  
21 skilled in the art may identify various other configurations of a means for decoding the  
22 control signal having and input and an output. For example, treadmill processor 220  
23  
24

1 and/or processor 214 may include a control signal decoder and hence be a means for  
2 decoding the control signal having an input and an output.

3       Following manipulation of the control signals to obtain the control instructions,  
4 treadmill processor 220 performs the control process on the various components of  
5 treadmill 12 as dictated by the control instructions. For example, treadmill processor 220  
6 may cause motor 46 to speed up thereby accelerating belt 42 or alternatively cause motor  
7 60 to rotate thereby raising or lowering tread base 26. Motors 46, 60 and 226, 228 are  
8 structures capable of performing the function of means, electrically coupled to the output  
9 of the decoding means for driving the moveable element in response to the decoded control  
10 signal. It may be appreciated by one skilled in the art that the control instructions may  
11 cause various other changes to the operating parameters of treadmill 12, and other devices.  
12 Similarly, various means for driving the moveable element in response to the decoded  
13 control signal. For example, the means may vary depending on the particular type of  
14 exercise device used.

15       While treadmill processor 220 is either decoding the control signal from the audio  
16 signal received from communication system 18 or merely activating speed motor 226  
17 and/or incline motor 228, processor 214 delivers the audio and video signals received  
18 through communication interface 210 to audio/video controller 212. Audio/video  
19 controller 212 manipulates the signals received and passes the audio signal to audio output  
20 device 96 and the video signal to video output device 94. Optionally, processor 214 may  
21 send portions of the audio or video signals to the output devices 218 to provide the user  
22 with multiple sources of representations of the current operating parameters of treadmill  
23 12, or exercise device.

24

1 In another alternative configuration of the present invention, the audio, video, and  
2 control signals received by communication interface 210 are delivered to processor 214 for  
3 manipulation and delivery to audio/video controller 212. In such a case, the video data is  
4 displayed on video output device 94 while the audio signal including the control signal is  
5 transmitted to audio output device 96. In this configuration, audio input device 90 or a  
6 second audio input device (not shown) is configured to receive various control signals that  
7 are delivered by audio output device 96 and pass those back to processor 214. The control  
8 signals are subsequently decoded and treadmill processor 220 may activate speed motor  
9 226 and/or incline motor 228 in accordance with the delivered control signals.

10 Generally, communication interface 210, processor 214, audio/video controller  
11 212, treadmill processor 220, and/or control signal decoder 224 are collectively and  
12 individually examples of a controller, responsive to the packetized second signal,  
13 configured to control the operating parameters of the exercise mechanism (preferably in  
14 real time). Additionally, such controller is a structure capable of performing the function  
15 of control means, communicating with the exercise mechanism, for receiving one or more  
16 packetized control signals from the communication system indicative of the selected  
17 exercise program and for changing one or more operating parameters of the exercise  
18 mechanism based upon the selected exercise program and the one or more packetized  
19 control signals. One skilled in the art can appreciate that the control means can have  
20 various other configurations.

21 Following hereinafter is a generalized discussion of a number of features of an  
22 exercise system, exercise devices, methods, computer products, and computer readable  
23 media associated with the teaching and disclosure of the present invention. Referring now  
24

1 to Figures 10-19, a system 250 is illustrated. The majority of the features described with  
2 respect to system 10, also apply to system 250.

3 Generally, this embodiment of the present invention may comprise one or more  
4 hardware components, such as those described above and illustrated in Figure 1, 7, and 10,  
5 and various special-purpose or general-purpose computers. Embodiments within the scope  
6 of the present invention also include computer-readable media for carrying or having  
7 computer-executable instructions or data structures stored thereon. Such computer-  
8 readable media can be any available media that can be accessed by a general-purpose or  
9 special-purpose computer and the hardware and/or software modules associated with  
10 system 10 (Figure 1). By way of example, and not limitation, such computer-readable  
11 media can comprise RAM, ROM, EEPROM, CD-ROM, or other optical disk storage,  
12 magnetic disk storage, or other magnetic storage devices, or any other medium which may  
13 be used to carry or store desired program code means in the form of computer-executable  
14 instructions or data structures and which may be accessed by a general-purpose or special-  
15 purpose computer. When information, such as one or more signals or programming is  
16 transferred or provided over network 16 or another communications connection (either  
17 hardwired, wireless, or a combination of hardwired or wireless) to treadmill 12, translator  
18 device 13, computer 14, communication system 18, and /or treadmill 20, such devices  
19 properly view the connection as a computer-readable medium. Thus, any such a  
20 connection is properly termed a computer-readable medium. Combinations of the above  
21 should also be included within the scope of computer-readable media. Computer-  
22 executable instructions may include, for example, instructions and data which cause a  
23  
24

1 general-purpose computer, special-purpose computer, or special-purpose processing device  
2 to perform a certain function or group of functions.

3 Although not required, the present invention will be described in the general  
4 context of computer-executable instructions, such as program modules, that may be  
5 executed by one or more computers in various network environments, such as within the  
6 environments illustrated in Figures 1, 7, and 10. Generally, program modules include  
7 routines, programs, objects, components, data structures, etc. that perform particular tasks  
8 or implement particular abstract data types. Computer-executable instructions, associated  
9 data structures, and program modules represent examples of program code means for  
10 executing steps of the methods disclosed herein. The particular sequence of such  
11 executable instructions or associated data structures represents examples of corresponding  
12 acts for implementing the functions described in such steps.

13 According to this illustrative embodiment of the present invention, a distantly  
14 located personal trainer performing an exercise on one treadmill in real-time may control  
15 one or more operating parameters of an exercise device used by a user performing an  
16 exercise program. However, it may be appreciated that the systems, methods, and devices  
17 of the present invention may be implemented and utilized in various other situations and  
18 with various other exercise devices or other devices unrelated to exercise devices. The  
19 systems and methods of the present invention may be implemented using a variety of  
20 hardware and/or software modules and include a variety of computer network  
21 configurations, including but not limited to multiple computers and/or exercise devices that  
22 are connected via the Internet, LANs, WANs, and the like.

1 To more easily explain the functions and structures of system 250, reference will  
2 now be made to Figure 10 that is a block diagram illustrating one embodiment of the  
3 present invention. As shown, system 250, that is similar to system 10, includes a number  
4 of user modules 252a-252n that represent, in this embodiment, multiple exercise devices,  
5 translator devices 13, and/or computers 14, whether such exercise devices, translator  
6 devices 13, and/or computers 14 are located in the same area, or distantly located one from  
7 another, such as at a number of user's homes. Alternatively, as discussed earlier, user  
8 modules 252a-252n may take the form of various other devices known by one skilled in  
9 the art. For example, the exercise devices may include treadmill 12, ellipticals, cycles,  
10 steppers, hikers, climbers, Nordic type exercise devices, and other various types of exercise  
11 devices as known by one skilled in art.

12 Generally, user modules 252a-252n include one or more exercise mechanisms with  
13 one or more moveable elements that enable a user to exercise during an exercise program,  
14 whether such exercise program requires anaerobic exercise, aerobic exercise, or a  
15 combination thereof. Therefore, the modules of each user module 252a-252n may be  
16 structures capable of performing the functions of: (1) control means for receiving one or  
17 more packetized controls signals from the communication system (communication  
18 module) indicative of a selected exercise program and changing one or more operating  
19 parameters of the exercise mechanism based upon the selected exercise program and the  
20 packetized controls signals; (2) interface means, communicating with the exercise  
21 mechanism, for gathering a first real-time signal from the user; (3) communicating means,  
22 communicating with the interface means, for receiving a packetized second signal, and  
23 optionally, for enabling transmission of the first signal; (4) means for reproducing the  
24

1 second signal; (5) means for controlling the operating parameters of the exercise  
2 mechanism; (6) means for decoding the control signals; and (7) means for driving the  
3 moveable element in response to the decoded control signals.

4 In one embodiment, user modules 252a-252n communicate with a communication  
5 module 254, via network 16. In one embodiment, communication module 254 has a  
6 similar configuration to that of communication system 18 and is capable of transmitting  
7 and receiving data from user modules 252a-252n. As such, communication module 254 is  
8 able to "transceive" information and data to and from the various modules, components,  
9 and other hardware and/or software modules of system 250.

10 Generally, in one illustrative embodiment, communication module 254 is  
11 configured to act as an intermediary module between user modules 252a-252n and the  
12 various other modules of system 250. Communication module 254, therefore, enables user  
13 modules 252a-252n to communicate with and select one or more exercise programs,  
14 whether based on a live-on-live request or recorded exercise programs. The structures and  
15 functions related to communication module 254 will be discussed in greater detail  
16 hereinafter.

17 Optionally communicating with communication module 254 is one or more trainer  
18 modules 256a-256n. As illustrated, communication module 254 is directly communicating  
19 with trainer modules 256a-256n. Alternatively, trainer modules 256a-256n may  
20 communicate with user modules 252a-n through network 16, therefore enabling user  
21 modules 252a-252n to communicate with trainer modules 256a-256n through network 16  
22 without interacting with communication module 254, such as illustrated in Figure 1, where  
23 a user treadmill 12 may communicate directly with a trainer treadmill 20.  
24

1 Trainer modules 256a-256n, in one illustrative embodiment, include the structures  
2 and functions of treadmill 20. Generally, trainer modules 256a-256n include one or more  
3 exercise mechanisms with one or more moveable elements that enable an individual to  
4 exercise during and exercise program, whether such exercise program requires anaerobic  
5 exercise, aerobic exercise, or a combination thereof. Additionally, trainer modules 256a-  
6 256n are configured to enable a trainer, whether a physical therapist, personal trainer, or  
7 the like to perform an exercise program substantially simultaneously with or without  
8 substantial delay with users exercising through user modules 252a-252n. Furthermore,  
9 trainer modules 256a-256n may include hardware and/or software modules and  
10 components that enable trainer modules 256a-256n to control the exercise devices  
11 incorporated within user module 252a-252n, such as treadmill 12. As such, trainer module  
12 256a-256n may include various exercise devices commonly known by one skilled in the  
13 art, and various hardware and/or software modules that enable the trainer to vary each user  
14 module 252a-252n, whether individually, collectively, or subsets of the entire group of  
15 user modules 252a-252n.

16 It may be appreciated by one skilled in the art that trainer modules 256a-256n may  
17 take various other configurations as known by one skilled in the art, in view of the teaching  
18 contained herein. For example, although trainer modules 256a-256n are depicted herein,  
19 trainer modules 256a-256n may be substituted for one or more additional user modules  
20 252a-252n. Therefore, system 250 may enable multiple users to interact one with another  
21 through network 16, without the capability to control one another. As referenced  
22 previously, it may be understood that system 10 may also enable multiple users to interact  
23 one with another through network 16, without the capability to control one another.  
24

1           Optionally communicating with communication module 254 is a third party control  
2 module 258. Third party control module 258, in one embodiment, enables some third  
3 party such as an additional personal trainer, medical provider, development team, and the  
4 like to view the current exercise program, while having the ability to control various  
5 operating properties of user modules 252a-252n and/or trainer modules 256a-256n. For  
6 example, in a health club setting, third party control module 258 may take the form of a  
7 console operated by an individual who is able to control the operating parameters of one or  
8 more exercise devices (e.g., during a spinning class), whether operated by a trainer or user,  
9 during an exercise program. It may be appreciated by one skilled in the art that various  
10 other configurations of third party control module 258 are applicable and known to one  
11 skilled in the art, in view of the teachings contained herein.

12           Through the illustrative configuration of control system 250 depicted in Figure 10,  
13 a user performing various exercise activities through user modules 252a-252n may  
14 communicate with trainers using trainer modules 256a-256n in real-time communication.  
15 Additionally, one user module 252a-252n may communicate with another user module  
16 252a-252n without communicating with one of trainer modules 256a-256n.

17           Generally, communication module 254 may act as and take the form of a server,  
18 with associated hardware and/or software modules to enable communication between the  
19 various modules of the illustrated system 250. As such, user modules 252a-252n, trainer  
20 modules 256a-256n, and third party control modules 210 may be considered clients of  
21 communication module 254. Alternatively, a separate server or a server network,  
22 illustrated in dotted lines and referenced by numeral 260 may communicate with  
23 communication module 254, with server 260 performing some or all of the functions of  
24

1 communication module 254 and the other modules described herein. In such a case,  
2 communication module 254 acts as a client. Generally, user modules 252a-252n,  
3 communication module 254, trainer modules 256a-256n, and third party control 210 may  
4 communicate one with another, via various communication line connections as discussed  
5 herein and known to one skilled in the art in light of the teaching contained herein.

6 Reference is now made to Figure 11, which is a more detailed schematic diagram  
7 of system 250. For ease of explanation, Figure 11 only shows one user module 252 and  
8 one trainer module 256; however it may be appreciated by one skilled in the art that a  
9 similar discussion may be made for multiple users and trainer modules 252, 256  
10 respectively. Further, third-party module 258 and server module 260 are not depicted, but  
11 one skilled in the art may appreciate that a similar discussion can be made with respect to  
12 the components and modules forming such modules in light of the discussion contained  
13 herein.

14 As shown, in one embodiment, user module 252 includes a user interface 262.  
15 User interface 262 enables a user utilizing the beneficial characteristics of user module 252  
16 to engage and give commands thereto with respect to various operating parameters of user  
17 module 252. For example, user interface 262 may include one or more interface devices as  
18 discussed previously, such as one or more audio and video input devices 90, 92, output  
19 devices 68a, 70a, 72a, 74a, 76a, and 80a, and one or more audio and video output devices  
20 94, 96 as described earlier herein. Therefore, user interface 262 enables the user to  
21 visually and/or audibly communicate with the trainer manipulating personal trainer module  
22 256, various other stored programming, or other users. Consequently, user interface 262  
23 may incorporate various structures and functions of treadmill 12, and more specifically  
24

1 control panel 22. Furthermore, user interface 262 may incorporate various portions of  
2 translator device 13 and computer 14, such as but not limited to monitor 166, keyboard  
3 160, mouse 162, and the like. User interface 262 is one structure capable of performing  
4 the function of interface means for gathering a first real-time signal from the user and also  
5 means for reproducing the second signal from the trainer.

6 It may be appreciated by one skilled in the art that user interface 262 and hence the  
7 interface means may take various forms or configurations to perform the desired function  
8 thereof. For example, user interface 262 and interface means may be a voice activated  
9 interface, a touch sensitive interface, an automatic monitoring system, such as a system  
10 that monitors heart rate, blood pressure, and the like and various other measurable  
11 parameters of user module 252 and a user exercising through user module 252.

12 User interface 262, in one embodiment, communicates with exercise module 264,  
13 such as treadmill or other mechanisms having a movable element. Exercise module 264  
14 includes various hardware and software components that enable an individual to obtain  
15 aerobic exercise, anaerobic exercise, combinations thereof, or the like exercise program.  
16 For example, in one embodiment exercise module 264 is treadmill 12 with computer 14  
17 and translator device 13. Alternatively, exercise module 264 is treadmill 12 with  
18 components of computer 14 and translator device 13 therein.

19 It may be appreciated that the various modules related to user module 252 may be  
20 incorporated within exercise module 264, or more specifically within treadmill 12 or some  
21 other device. In another configuration, exercise module 264 includes a movable element,  
22 such as belt 42, that allows the user to exercise. In yet another configuration, exercise  
23  
24

1 module 264 may incorporate the structure and functionality associated with user interface  
2 262 therein.

3 Communicating with exercise module 264 is a data storage module 266. Data  
4 storage module 266, in one embodiment is a database of operating parameters for exercise  
5 module 264 with respect to one or more exercise programs. As such, data storage module  
6 266 may be a ASIC chip, programmable ROM, CD-ROM, EEPROM, PCMCIA card,  
7 compact flash card, flash bios, dynamic memory, magnetic storage disk, optical storage  
8 media, or the like. Additionally, data storage module 266 may be a hierarchal, relational,  
9 or other typical database, including related database management systems (not shown).  
10 Generally, data storage module 266 contains the data and information to operate exercise  
11 module 264 in accordance with a selected program by a user operating user module 252 or  
12 alternatively to perform the necessary exercise program designated by the operator of  
13 training module 256. Furthermore, data storage module 266 may store programming  
14 retrieved from communication module 254 in preparation for activation of exercise module  
15 264 upon a request from a user, communication module 254, or trainer module 256. Data  
16 storage module 266 may be incorporated within exercise module 264 such as when user  
17 interface 262, exercise module 264, and data storage module 266 are part of treadmill 12,  
18 whether or not translator device 13 and/or computer 14 is integrally formed therewith.

19 Communicating with exercise module 264 is a safety module 268. Safety module  
20 268 optionally communicates with storage module 224. Safety module 268 is intermediate  
21 between an interface module 270 and exercise module 264 and controls the data  
22 transferred through network 16 from communication module 254. As such, safety module  
23 268 tracks the information delivered from communication module 254 and automatically  
24

engages a program stored within data storage module 266 upon disengagement of the connection with communication module 254 through interface module 270, thereby delivering one or more safety signals to exercise module 264. Alternatively, safety module 268 may maintain the operating parameters of exercise module 264 at the same level as before disengagement of user module 252 from communication module 254, thereby sending safety signals that maintain the operating parameters of exercise module 264 at the same level as before interruption of the programming. In yet another configuration, safety module 268 sends one or more safety signals that slowly decrease all the operating parameters of exercise module 264 to either a user defined or communication module 254 defined base level or to zero upon disengagement of user module 252 from communication module 254. In still another configuration, safety module 268 maintains the current operating parameters of exercise module 264, such as treadmill 12, while allowing a user of exercise module 264 to view such operating parameters and manipulate or change the same using user interface 262, such as speed controls 68, incline controls 70, time controls 72, distance controls 74, a start button 76, and a stop or pause button 78, as illustrated in Figure 6. As such, safety module 268 may include various hardware and/or software components and modules necessary to perform the desired function, such as but not limited to a buffer to store programming received from communication module 254. Therefore, safety module 268 is one example of a safety mechanism that is capable of manipulating the operating parameters of the exercise mechanism in the event that a packetized second control signal is interrupted. As such, safety mechanism may generate one or more safety signals to operate the exercise mechanism, as discussed herein. Safety module 268 is another example of communicating mechanism of the present invention.

1 Interface module 270, connected to safety module 268, manipulates the information  
2 and data transceived through user interface 262, whether such data is to be delivered to  
3 exercise module 264 or for delivery to communication module 254 through network 16.  
4 As such, interface module 228 performs various operations on the data, such as but not  
5 limited to encrypting data, decrypting data, buffering data, packetizing data, depacketizing  
6 data, and the like. Interface module 270 is one example of a communicating mechanism,  
7 communicating with the interface, the communicating mechanism enabling real-time  
8 transmission of the first signal to a trainer, the communicating mechanism receiving a  
9 packetized second real-time signal. In addition, interface module 270 is an example of  
10 structure capable of performing the function of a communicating means, communicating  
11 with the interface means, for receiving a packetized second signal, and optionally, for  
12 enabling transmission of the first signal.

13 It may be appreciated by one skilled in the art that there are various other  
14 configurations of interface module 270 and hence communicating means. For example,  
15 interface module 270 may facilitate communication be data between one or more users  
16 rather than between user module 252 and trainer module 256.

17 Generally, each of the modules referenced as being included within user module  
18 252 may be integrally formed with treadmill 12 or exercise module 264. Those modules  
19 may, alternatively, be added to or installed within an existing exercise device to allow the  
20 same to communicate with communication module 254. Therefore, the particular  
21 functions of each of the modules referenced within user module 252 may vary depending  
22 on the particular characteristics and properties of the exercise device. Similarly, user  
23  
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1 module 252 may include various other modules that may be appropriate, as understood and  
2 may be identified by one skilled in the art.

3 User interface 262, safety module 268, data storage module 266, and/or interface  
4 module 270 are examples of a controller, responsive to the packetized second real-time  
5 signal, configured to control the operating parameters of the exercise mechanism (or  
6 exercise module) in real time. Additionally, such controller is a structure capable of  
7 performing the function of control means, communicating with the exercise mechanism (or  
8 exercise module), for receiving one or more packetized control signals from the  
9 communication system (or communication module) indicative of the selected exercise  
10 program and for changing one or more operating parameters of the exercise mechanism (or  
11 exercise module) based upon the selected exercise program and the one or more packetized  
12 control signals. One skilled in the art can appreciate that the control means may have  
13 various other configurations.

14 Communicating with user module 252 via network 16 is communication module  
15 254. As shown, communication module 254 includes a communication user interface  
16 module 272 that transceives data, such as audio, video, and control signals between user  
17 module 252 and communication module 254. Communication user interface module 272  
18 may have various forms, such as but not limited to those described herein with respect to  
19 interface 190. Additionally, communication user interface module 272 may include  
20 various hardware and/or software modules and components to encrypt data, decrypt data,  
21 buffer data, packetize data, and depacketize data, and the like.

22 Communicating with communication user interface module 272 is control module  
23 274 that may have a similar configuration and function to control processor 192 in Figure  
24

1 8. Control module 274 performs many of the functions recited with respect to control  
2 processor 192, in that control module 274: (1) manipulates the data to be transmitted to  
3 user module 252, (2) enables the user to select one of a plurality of different programs,  
4 whether such programs are stored or live, such as those stored in memory 278, (3) requests  
5 the creation of control signals by control signal generation module 282 which may be  
6 synchronized with the exercise programs, (4) transmits data between one or more user  
7 module 252, between one or more user modules 252 and trainer module 256 via  
8 communication trainer interface module 276, between one or more user modules 252  
9 and/or third party module 258, and the like.

10 Additionally, control module 274 may access data that is stored in one or more  
11 memory modules: memory 194 and external memory 196, such as the data retrieved from  
12 user module 252. Consequently, control module 274 may analyze data sensed by sensors  
13 that track the operating parameters of the user module 252. For instance, the data can be  
14 representative of (i) the ampere draw by various components of user module 252; (ii) the  
15 tension of the belt of user module 252; (iii) thickness of the wear layer of the belt; (iv) the  
16 number of hours user module 252 has operated; (v) equivalent number of miles for which  
17 user module 252 has been used; (vi) number of hours remaining before scheduled  
18 maintenance based upon usage and/or past maintenance date; (vii) treadmill power usage;  
19 (viii) operating status and efficiency of the various components of user module 252; (ix)  
20 weight of the exercising user, resulting in processor 214 and/or treadmill processor 220  
21 varying the operating parameters of user module 252 to accommodate the heavier user; (x)  
22 voltage input and output to various components of user module 252; (xi) and the like.

1 In response to analyzing the above data, control module 274, whether automatically  
2 or with the aid of trainer module 256, third-party module 258, server module 260 and/or  
3 other personal can provide feedback to the exercising user and/or change the operating  
4 parameters of user module 252. For instance, control module 274 can proscribe  
5 maintenance, stop user module 252 from operating, warn the user through video output  
6 device 94 or via some other manner, such as e-mail or a letter of problems with user  
7 module 252, in a gym or spa setting, inform the owner or operator of the gym or spa of  
8 pending maintenance problems with specific exercise devices, and optionally schedule  
9 maintenance for the particular exercise device, and the like.

10 Furthermore, control module 274, may automatically disconnect data  
11 communication between user module 252 and communication module 254 when the  
12 movable element of exercise module 264 is stopped by the user. For example, in a gym  
13 type setting, once an individual connects to communication module 254, and/or  
14 communication system 18, control module 274 provides access to communication module  
15 254 with associated programming. As a user exercises, control module 274 tracks the  
16 active status of the movable element of exercise module 264 to determine whether the user  
17 is continually exercising. When the user activates, through user interface 262, stop/pause  
18 button 78 (Figure 6), control module 274 disconnects the user from communication  
19 module 254. Furthermore, control module 274 clears the temporary data file stored in  
20 storage module 224 of user module 252 and may also clear the temporary data files stored  
21 in communication module 254 that relate to the particular user. In this way, control  
22 module 274 prepares user module 252 and communication module 254 for use by  
23 subsequent users. Although the above discussion is directed to control module 274, it may  
24

1 be appreciated by one skilled in the art the control processor 192 may perform the same  
2 function with control processor's hardware and/or software modules and components.

3 Control signal generation module 282 may have a similar configuration to that of  
4 control signal generator 200 (Fig. 8), so long as control signal generation module 282 is  
5 capable of creating one or more control signals that may be synchronized with the audio  
6 and video signals retrieved from memory 194, 196 or received through communication  
7 trainer interface 276 from trainer module 256.

8 Trainer module 256 has substantially the same configuration as that of user module  
9 252. Therefore, trainer module 256 includes an interface module 284 for transceiving data  
10 between trainer module 256 and communication module 254. Communicating with  
11 interface module 284 is an exercise module 286 and optionally a data storage module 288.  
12 Furthermore, trainer module 256 includes a trainer interface 290 that enables a trainer to  
13 input various exercise parameters to change the operating parameters of user module 252.  
14 Trainer interface 290, therefore, may include the various input devices recited previously  
15 with respect to user module 252 and/or treadmill 12.

16 Trainer module 256 optionally includes a control signal generation module 292.  
17 Control signal generation module 292 enables trainer module 256 to generate control  
18 signals that are synchronized with the audio and/or video signals that are transmitted from  
19 trainer module 256 to user module 252. Control signal generation module 292, therefore,  
20 is substantially the same as control signal generation module 282.

21 The synchronization of the audio and/or video signals with the control signals may  
22 be achieved in a variety of different manners. For example, in one embodiment of such  
23 synchronization, the audio and/or video signals indicate that the treadmill speed will move  
24

1 from 1 mile per hour to 5 miles per hour. The control signal may not automatically move  
2 the speed to 5 miles per hour, but may instead ramp gradually from 1 mile per hour to 5  
3 miles per hour. Optionally, the control signal and video/audio signals are synchronized  
4 such that the exercise device substantially instantaneously increases the speed of the  
5 treadmill upon receipt of a message requesting such an increase in the treadmill's speed.

6 Following hereinafter is a discussion of the various optional modules that may be  
7 incorporated within communication module 254, in addition to those discussed earlier. It  
8 may be appreciated by one skilled in the art, that communication module 254 includes the  
9 typical user interfaces and communication interfaces for enabling user module 252a-252n  
10 to communicate with training module 256a-256n and optionally another user module 252a-  
11 252n. Generally, therefore, communication module 254 includes various other functional  
12 modules. Additionally, the following discussion describes various functions of  
13 communication system 18 and its interaction with a user at treadmill 12, computer 14,  
14 translator 13, third party 21, and/or a trainer at treadmill 20

15 As shown in Figure 12, communication module 254 (Figure 11) includes, in one  
16 embodiment, an iFit.com website 300 that acts as both an interface with the user, while  
17 also controlling the operation of user module 252a-252n and/or trainer module 256a-256n.  
18 As such, iFit.com website 300 is in communication with a number of various other  
19 modules forming one embodiment of communication module 254. Each module depicted  
20 may represent functionality included within communication module 254, while  
21 representing structural hardware and/or software modules that may either be incorporated  
22 within the hardware and software modules of iFit.com website 300, or alternatively,  
23 accessible by the hardware and software modules forming iFit.com website 300.  
24

1 Generally, the iFit.com website 300 is hosted on one or more computers, whether a  
2 general-purpose or special-purpose computer, that may have the form of computer 14, or  
3 any variation thereof known by one skilled in the art in view of the teaching contained  
4 herein. As such, the hardware and software modules forming iFit.com website 300 may  
5 include those listed herein with reference to computer 14. As depicted in the illustrative  
6 configuration of Figure 12, iFit.com website 300 may include login-registration module  
7 302, audio program module 304, video program module 306, health information module  
8 308, consumer purchase module 310, personal training module 312, competition module  
9 314, diagnostic module 318, program generation module 318, advertising module 320, and  
10 links module 322.

11 According to one aspect of the present invention, communication module 254  
12 includes a login-registration module 302 that is accessible via iFit.com website 300.  
13 Login-registration module 302 is configured to obtain the necessary registration and login  
14 information from a user wishing to use communication module 254 and the various  
15 audio/video and literary information contained therein, with their exercise device.  
16 Consequently, login-registration module 302 provides access to the appropriate areas of  
17 iFit.com website 300 and also to the particular portions of memory 278 containing data  
18 associated with the particular user gaining access to iFit.com website 300.

19 Referring now to Figure 13, a flow diagram illustrating the operation of login-  
20 registration module 302 is depicted. Initially, login-registration module 302 identifies  
21 whether the user has logged into the communication module 254 before, as represented by  
22 decision block 330. In the event that the user is accessing or "logging in" to iFit.com  
23 website 300 for the first time, login-registration module 302 gathers the user information,  
24

1 as shown by block 332. Specifically, login-registration module 302 may gather the user's  
2 name, age, sex, type of exercise equipment being used, and various other data unique to the  
3 user. Additionally, login-registration module 302 may present the user with multiple  
4 questions to obtain statistical information regarding the user's background, education,  
5 work experience, income, hobbies, and other related information to aid operators of  
6 communication module 254 and system 250 in providing greater instructional information  
7 to the user. Furthermore, such statistical information may also be used in targeting specific  
8 advertisement to the individual during an exercise program.

9 As information is gathered from the user, payment information, such as credit card  
10 numbers, accounts, and the like may further be obtained from the user. Alternatively, as  
11 depicted in Figure 12, the step of obtaining payment information may follow the gathering  
12 of the user information, as shown by block 334. Once all the necessary information is  
13 gathered, login-registration module 302 assists the user in defining a login user  
14 identification number (user ID) and password that are unique to the particular user, as  
15 depicted by block 336. Upon defining the user password and user ID communication  
16 module 254 stores the information within a memory of communication module 254 and  
17 optionally user module 252. The user is subsequently asked to login to communication  
18 module 254.

19 Following the logging in procedure, the user is given access, as depicted by block  
20 340, to communication module 254 to the specific level that they are allowed, based upon  
21 their responses to the various questions asked during the login procedure. For example, if  
22 a user defines the exercise device as a treadmill located at home, the user may be limited to  
23 only the treadmill related web pages of iFit.com website 300. Similarly, if a user does not  
24

1 define any account information the user may be limited to only the free web pages and  
2 information available thereon, while being restricted to access the fee-based web pages,  
3 such as to purchase exercise profiles, exercise equipment, and the like.

4 Referring again to decision block 330, if a user accesses communication module  
5 254 for a second or any other subsequent times, decision block 330 is in the negative, and  
6 login-registration module 302 gathers the user ID and password from the user, as depicted  
7 by block 342. Upon gathering the user ID and password, login-registration module 302  
8 verifies the user ID and password with the stored user ID and password, as represented by  
9 block 344. Subsequently, login-registration module 302 either rejects access to  
10 communication module 254 or alternatively allows access thereto with the specific level of  
11 access, as shown by blocks 346 and 340, such as to a particular portion of memory 278  
12 designated for use by the users.

13 It may be appreciated by one skilled in the art, that various other functionality and  
14 structures might form login module 302. For example, login-registration module 302 may  
15 incorporate various processors, micro-controllers, logic circuits, and the like to analyze and  
16 store the information input during a login process. In one configuration, login-registration  
17 module 302 may communicate with user module 252 during the login process to verify  
18 that the exercise device used by the user is the same as previously indicated by the user  
19 during previous logins. In the event that the exercise device differs, whether by type,  
20 model or the like, login-registration module 302 may cause communication module 254 to  
21 either prompt the user to change the stored login information, thereby varying the access to  
22 the various programs, or automatically change the login information and associated access  
23 in light of the changed exercise device.

1 In another configuration, login-registration module 302 may be a separate hardware  
2 and/or software module or component that is located distantly from the hardware and/or  
3 software components or modules of communication module 254. In still other  
4 configurations, login-registration module 302 may be further adapted to store information  
5 regarding the use of exercise equipment. For example, login-registration module 302 or  
6 some other module of communication module 254 may track the amount of time that a  
7 user spends exercising on a particular type of exercise device, thereby determining a user's  
8 exercising preferences.

9 Furthermore, login-registration module 302 may track the particular locations  
10 where the user trains to identify a user profile of the user's exercise activities throughout  
11 the United States of America or the World. Such information may then be used to provide  
12 the user with specific information related to those locations where the user exercises most.  
13 For example, the user may receive targeted advertising to exercise and non-exercise related  
14 businesses or services within the city or state of the place where the individual commonly  
15 visits or exercises.

16 Referring back to Figure 12 communication module 254 includes an audio program  
17 module 304. Generally, audio program module 304 is configured to provide the user with  
18 multiple selections of audio programs that are available for particular types of exercise  
19 device. Additionally, audio program module 304 allows the user to purchase copies of the  
20 audio programs that may be performed on line.

21 As depicted in Figure 14, audio program module 304 allows the user to select from  
22 various types of exercise devices with associated audio programs. As illustrated, audio  
23 program may have separate information for treadmills, ellipticals, cycles, steppers, hikers,  
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1 climbers, Nordic type exercise devices, and various other types of exercise devices known  
2 by one skilled in the art. As such, a user may manually select the particular exercise  
3 device to be used. Alternatively, audio program module 304 may dynamically select the  
4 particular exercise device and the various audio programs applicable to the user's exercise  
5 device by analyzing the user information gathered by login-registration module 302. No  
6 matter the manner by which the particular exercise device is selected, Figure 15 depicts an  
7 illustrative flow diagram that depicts possible user selections and data flow related to  
8 accessing the one or more audio programs available through communication system 18,  
9 and more specifically iFit.com website 300.

10 As shown, upon selecting a particular exercise device (whether manually or  
11 dynamically as discussed above), as depicted by block 350, the user is allowed to select the  
12 type of music to be played during the program session, as depicted by block 352. Once the  
13 user has selected the particular music type, the user is given the option to view the program  
14 information to determine if the difficulty level is too great, as depicted by decision block  
15 354. For example, if the individual wishes to view the exercise program profile,  
16 communication module 254 packetizes an audio and/or graphical representation of the  
17 exercise program selected (i.e., the maximum speed, maximum incline, time to perform the  
18 exercise program, amount of time at each maximum speed and incline, and various other  
19 operating parameters known to one skilled in the art) and transmits the data to either the  
20 integrally formed video output device 92 (Figures 1 and 6) mounted on treadmill 12, or  
21 alternatively, to monitor 166 (Figure 7) associated with computer 14 for review by the  
22 user, as depicted by block 356.

1 Alternatively, the user may decide not to view the user profile, such that the  
2 response to decision block 354 is in the negative. Whether or not the user views the  
3 exercise profile, the user may select to begin the online exercise program, as depicted by  
4 decision block 358. If the user selects in the affirmative, communication module 254  
5 delivers the audio signals, with control signals, to user module 252 in accordance with the  
6 selection. Consequently, communication module 254 may download the entire audio  
7 program to user module 252, or alternatively "stream" the audio signals thereto by a  
8 manner known by one skilled in the art. Upon completion of the program, as depicted by  
9 block 360, the user is given the opportunity to purchase their own copy of the audio  
10 program just performed, as represented by decision block 364. In the event they decline to  
11 purchase the program session, the particular audio program session is completed and the  
12 user is optionally returned to the homepage of iFit.com website 300.

13 Referring again to decision block 358, if the user selects not to perform the online  
14 program, the user may optionally select to purchase the program, as depicted by decision  
15 block 364. If this selection is in the negative, the user is returned to the homepage of  
16 iFit.com website 300. Otherwise, if the user wishes to purchase the program, audio  
17 program module 302 gathers account information, as depicted by block 366 and media  
18 format, such as CD, tape, MP3 file, or the like, as depicted by block 368. Furthermore,  
19 audio program module 304, through video output device 90 or monitor 166 displays the  
20 pricing guides for various types of media and/or associated mailing costs, as depicted by  
21 block 370. Alternatively, audio program module 304 may interface with an accounting  
22 module that performs the function of storing and collecting account information and  
23 purchase information from any of the various modules associated with communication  
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1 module 254. As such, communication module 254 may have a centralized accounting  
2 module that is accessible by one or more of the various modules forming communication  
3 module 254. Furthermore, in another alternate configuration, audio program module 304  
4 may communicate with login-registration module 304 and obtain account information  
5 therefrom or directly access the information from the portion of memory 278 containing  
6 the account information.

7 Referring again to Figure 12, communication module 254 further includes video  
8 program module 306. Video program module 306 uses a similar flow of information and  
9 related functional operations as audio program module 302; however, video program  
10 module 306 merely gives video options to the user, whether such video options include or  
11 exclude audio programs transposed or incorporated therein. Therefore, instead of selecting  
12 a music type, video program module 306 enables a user to select a video program session  
13 and receive real-time or streamed video and/or audio signals. Similarly, in the event the  
14 user wishes to purchase the video program, video program module 306 enables the user to  
15 select a particular type of video format such as CD ROM, DVD, video tape, MP3 file, and  
16 the like.

17 According to another aspect of the present invention, communication module 254  
18 includes a health information module 308. Health information module 308, in one  
19 embodiment, includes a searchable database of information related to health issues for  
20 those exercising and/or those who wish to begin to exercise using communication module  
21 254. As such, in one configuration, health information module 308 is a distantly located  
22 database, such as a relational, hierarchal, or some other database that is accessible by the  
23 iFit.com website 300. Alternatively, health information module 308 may be incorporated  
24

1 within the hardware and/or software components and modules hosting iFit.com website  
2 300.

3       Communication module 254 may optionally include a consumer purchase module  
4 310. Consumer purchase module 310 is configured to enable a user to purchase exercise  
5 equipment, materials such as books and instructional materials, nutritional supplements,  
6 and the like online. Consumer purchase module 310 may, therefore, link directly to one or  
7 more affiliates of communication module 254. Alternatively, consumer purchase module  
8 310 may include a database, whether relational, hierarchal, or the like that has stored  
9 specifications, pricing guides, illustrative images of exercise devices and products, and the  
10 like, that a user may search through to find the necessary or desired exercise equipment.  
11 Additionally, consumer purchase module 310 may include the necessary hardware and/or  
12 software modules to gather and store billing and purchase information from the user or  
13 alternatively, consumer purchase module 310 may communicate with a centralized  
14 accounting module that performs the necessary functions typically known by one skilled in  
15 the art related to accounting, billing, purchasing, sales, and the like activities.

16       According to another aspect of the present invention, communication module 254  
17 includes a personal training module 312. Personal training module 312 enables a user to  
18 interact with a personal trainer on a live-on-live exercise session whether in a one on one  
19 session or in a group setting. Additionally, personal trainer module 312 enables the user to  
20 ask questions and receive communications from one or more personal trainers related to  
21 exercise advice, techniques, and programs, whether or not in real-time.

22       Referring now to Figure 16, a schematic representation of the various illustrative  
23 functional modules of personal training module 312 are illustrated. As shown, personal  
24

1 training module 312 includes a scheduling module 380 that enables various individuals to  
2 schedule times to talk to and optionally perform a live workout program. Scheduling  
3 module 380 enables the user to access a profile module 382 that contains one or more  
4 trainer profiles. In this way, personal training module 312 enables a user to review the  
5 profiles of the various trainer to select the particular trainer that best suits the users needs  
6 and/or time requirements. Profile module 382 may, therefore, include a database, whether  
7 relational, hierarchical, or the like, or some other data storage hardware and/or software  
8 that is capable of storing data in an accessible form.

9 Scheduling module 380, in one embodiment, communicates with a calendaring  
10 module 384 that lists the days of the month and the particular times available for one-on-  
11 one exercise programs with each trainer. Additionally, calendaring module 384 may list the  
12 times of group sessions and enable a user to select a particular session time reference  
13 within calendaring module 384 for the user to exercise with a personal trainer.

14 As shown, scheduling module 380 may communicate with a mailbox module 386  
15 that includes multiple mailboxes, one for each user and trainer. Each mailbox may receive  
16 email from trainers and other users of communication module 254, or alternatively, only  
17 trainers or communication module 254 may deliver a message 388 to each user, such as  
18 electronic mail. Generally, each mailbox is configured to receive messages from the  
19 trainers regarding schedule one-on-one exercise sessions or group sessions. Additionally,  
20 communication module 254 or iFit.com website 300 may deliver notifications of upcoming  
21 special group exercise session, or other information related to the user and/or exercising.  
22 Each user and/or trainer may save unique exercise programs created by the user and/or the  
23 trainer within data storage 390 accessible by mailbox module 386. Optionally, data  
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1 storage 390 may correspond to memory 278 (Figure 11) or other external memory that is  
2 accessible to mailbox module 386.

3 Communicating with personal training module 312 is a video conferencing module  
4 392. Video conferencing module 392 provides the functional hardware and/or software to  
5 allow a user to videoconference with a personal trainer. For example, video conferencing  
6 module 392 may include various hardware and/or software modules that: (1) assist with  
7 data transmission of audio and/or video signals between user module 252a-252n and  
8 trainer module 256a-256n; (2) assist with image and voice capturing; (3) packetizing or  
9 depacketizing data, and the like, such as those discussed with respect to system 10, or  
10 otherwise known to those skilled in the art in light of the teaching contained herein.  
11 Additionally, video conferencing module 392 allows the user to videoconference with the  
12 personal trainer in either a private room, as represented by numeral 394 or in a public  
13 room, as represented by numeral 396. In either case, (i.e., in the private or public room)  
14 the user may exercise with the personal trainer in a one-on-one or group setting.

15 It may be appreciated by one skilled in the art, that the functionality described  
16 herein with respect to personal training module 312 may be varied and is only illustrative  
17 of one possible embodiment thereof. Other functionality and associated structures such as  
18 hardware and/or software modules may be included within personal trainer module 312.  
19 Furthermore, various other linkages may occur between the various functional modules of  
20 personal training module 312. For example, in one alternate embodiment, calendaring  
21 module 384 is linked with private room 394 such that upon scheduling a one-on-one  
22 exercise program, a private room is automatically scheduled for the user. Additionally,  
23 calendaring module 384 may automatically send a message to the user's mailbox, thereby  
24

1 providing the user with information regarding the particular private room scheduled and a  
2 reminder of the schedule time.

3 According to another aspect of the present invention, as illustrated in Figure 12,  
4 iFit.com website 300 includes a competition module 314. Competition module 314  
5 enables one or more individuals to engage in competitive exercise programming with one  
6 another or alternatively with the communication module 254 hosting iFit.com website 300.  
7 Such competitive exercise programming motivates the users to exercise on a more regular  
8 basis while also setting goals for the individual to reach. Competition module 314,  
9 therefore, provides various benefits to those seeking to exercise on a regular basis.

10 Referring now to Figures 17A-17D, a flow diagram representing one illustrative  
11 operation of competition module 314 is depicted. As shown, a user selects the particular  
12 race types that they wish to engage in, as depicted by block 400. Three types of races are  
13 depicted; race around the world 402, race against the computer 404, and personalized race  
14 406; however various other race types are applicable and known to one skilled in the art, in  
15 view of the teaching contained herein.

16 One particular race type is a race around the world. In the race around the world  
17 type race, an individual races against various other individuals to determine who will run  
18 around the world in the shortest time. Communication module 254 tracks the exercising  
19 activities of competing users of user modules 252a-252b and computes the distance  
20 traveled per exercise session and per user. A running total of the distance traveled is  
21 maintained and updated, such as in data storage module 390 and/or some other portion of  
22 memory 278. Each competitor may compare the total distance traveled against other  
23  
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1 competitors to see who runs a number of miles equivalent to running around the world in  
2 the shortest time.

3 With reference to Figure 17A, when the race around the world race type is selected,  
4 competition module 314 retrieves the stored statistical information of the user, as depicted  
5 by block 410, such as from memory 278. The statistical information may include, but is  
6 not limited to, distance traveled by the user, average speed of the user, and the like. Once  
7 competition module 314 selects the stored statistical information, such information may be  
8 compared against other competitors in the race, as depicted by block 412. Competition  
9 module 314 may deliver comparison data to communication module 254. In turn,  
10 communication module 254 may deliver a graphical representation of the user's exercise  
11 distant, times, speed, and other information compared against other competitors to the user  
12 via user module 252a-252n. A user module 252a-252n or a user operating treadmill 12, for  
13 example, may view their distance and times with respect to other competing users of user  
14 modules 252a-252n, thereby being motivated to exercise more. Once such information is  
15 depicted, the user may modify their existing exercise programs to either increase or  
16 decrease exercise parameters of the programs. For example, if the user sees that they have  
17 not run as many miles as other competitors, they may increase the distance to be run in the  
18 future. Once the user is ready, the user may begin or continue the race, as represented by  
19 block 414. As the user exercises communication module 254 records new statistical  
20 information for the user, such as speed, distance traveled, calories used, and the like.

21 It may be appreciated by one skilled in the art that various other configurations of  
22 the race around the world type race are applicable and known to one skilled in the art. For  
23 example, in another configuration of the race around the world type race, a user may select  
24

1 a particular time period, say from January 1 to February 1, and race against others to see  
2 who travels the furthest distance within the given time period. Again, communication  
3 module 254 tracks the distance traveled of each competitor and may provide graphical  
4 representations of the position of one competitor against the other competitors. In still yet  
5 another configuration, the race around the world may include racing over various types of  
6 terrain ranging from deserts, mountains, and the like. As such, each competitor follows a  
7 similar overall exercise profile and communication module 254 tracks the time that a user  
8 takes to complete the race, for example, when a user slows down the treadmill based upon  
9 the terrain traversed.

10 Referring again to Figure 17A, the user may optionally select to race against the  
11 computer, as referenced by block 404. As the name of the race type suggests, this option  
12 enables the user to select a particular type of race and a particular skill level of the  
13 computer against which to race. As shown in Figure 17C, a user selects the difficulty level  
14 for the particular race, as represented by block 416, such as in the case of a treadmill, the  
15 speed, incline, distance, and the like. This may also enable the user to select a particular  
16 skill level of the computer, such as a beginner runner, intermediate runner, or advanced  
17 runner. Additionally, the user may select various other options, as represented by block  
18 418, such as a head start for the computer or the user, scaling of the particular difficulty  
19 level, and the like. Upon completing the selections, the user may race against the  
20 computer, as represented by block 420.

21 With reference to Figure 17A, another type of race is a personalized race, as  
22 depicted by block 406. In the personalized race, two or more individuals schedule a live  
23 on live session, such as in a private room of personal training module 312 where they may  
24

1 race one against the other, while viewing graphical representations of the distant, time, and  
2 speed of the other competitors. Alternatively, two or more individuals may schedule a race  
3 where the start time is adjusted based upon the particular location of the competitors.

4 As shown in Figure 17D, a user may select a time-adjusted race, as depicted by  
5 decision block 422. If the user rejects time adjustment, then the user will race against one  
6 or more competitors in a live-on-live competition. The user selects one or more  
7 competitors, as referenced by block 424. Following the selection, each competitor enters a  
8 private room to begin the race and to synchronize each competitor's exercise device with  
9 communication module 254 and each other, as depicted by block 426. Alternatively, each  
10 competitor may merely enter the private room that has been scheduled for the race, thereby  
11 automatically selecting each competitor for the race, while synchronizing each  
12 competitor's exercise device in block 426 in preparation for beginning the race as depicted  
13 by block 428.

14 Synchronization prepares the communication links between each competitor and  
15 generates the displays and data flow therebetween, such as but not limited to the audio and  
16 video data flows and displays that enable each competitor to view their progress against  
17 each other. For example, the display may include a racing track that shows a relative  
18 position of each competitor one with another, or a trail that each competitor races along. It  
19 may be appreciated that various other data flows and displays are appropriate and known to  
20 one skilled in the art in view of the teaching contained herein.

21 As suggested above, the user may select a time-adjusted race. The time-adjusted  
22 race allows two or more competitors to conveniently race against each other. For example,  
23 the time-adjusted race allows an individual on the east coast to race against individuals in  
24

1 the Mountain Time zone and the west coast at the same local time, for example 5:00 p.m.  
2 The time-adjusted race, therefore, stores the race of one individual, say the individual on  
3 the east coast who races at 5:00 p.m. and then rebroadcasts the stored exercise race to those  
4 other individuals in various other time zones upon reaching the designated time period,  
5 such as 5:00 p.m. Mountain Standard Time, pacific time, and the like.

6 With reference to Figure 17D, for ease of explanation, let us assume that three  
7 individuals, one on the east coast, one in the Mountain Time zone, and one on the west  
8 coast wish to race against each other at 5:00 pm local time. Each competitor accesses  
9 communication module 254 and selects each other as competitors, block 430, in a time-  
10 adjusted race, as depicted in decision block 422. Each competitor defines the particular  
11 time period or adjusted time at which each individual is to race, as depicted by block 432.  
12 The selections and adjusted times for each competitor are stored in one or more databases  
13 or other storage modules associated with an identification number given to the time-  
14 adjusted race or directly to each competitor, such as data storage module 390 or memory  
15 278. Once the information is entered and stored, the competitor on the east coast may  
16 perform their race on their own or with the aid of a pace setter generated by the computer  
17 at the appointed time, as depicted by block 434. Once the east coast competitor finishes  
18 their race, the statistical information and a real-time representation of the race is stored, as  
19 represented by block 436. Upon the arrival of the adjusted time for the Mountain Time  
20 zone competitor to race, communication module 254 will rebroadcast the particular race  
21 performed by the east coast competitor to the Mountain Time zone competitor. Similarly,  
22 upon the time for the west coast competitor to race, communication module 254 will  
23 rebroadcast the particular race performed by the east coast competitor and optionally the  
24

1 Mountain Time zone competitor to the west coast competitor. It may be appreciated by one  
2 skilled in the art that the live on live and time-adjusted races may be performed in a variety  
3 of different manners. For example, the number of competitors is not limited to any  
4 specific number. Additionally, the time adjustments may allow for competitors throughout  
5 the world to race one against another.

6 It may be appreciated by one skilled in the art that competition module 314 may  
7 have various other configurations. For example, the functionality of competition module  
8 314 may be incorporated within user modules 252a-252n. As such, two or more user  
9 modules 252a-252n may be in direct communication one with another, without the aid of  
10 communication module 254, and the internal modules of user modules 252a-252n enable  
11 competition data to be transceived between the user modules 252a-252n.

12 With reference again to Figure 12, communication module 254 further includes a  
13 diagnostic module 316. Diagnostic module 316 enables the user to perform a diagnostic  
14 analysis of their particular exercise device or product in the case of disconnection or  
15 changes in the operation of their exercise device or product. Additionally, diagnostic  
16 module 316 enables the user to update and change operational parameters of the user's  
17 exercise device or product, either through manual activation of diagnostic control 88  
18 (Figure 6) or automatically through communication module 254. For example, in the event  
19 a new software update is available for the particular exercise device's software,  
20 communication module 254 may automatically recognize operation of the update and  
21 deliver the same to each individual having an exercise device or product that may benefit  
22 from updating of the software. Additionally, the diagnostic module 316 may identify  
23 problems with the exercise device through remote monitoring of user module 252a-252n  
24

1 and subsequently schedule arrival times for maintenance workers to resolve physical  
2 problems that are unable to be fixed by remote communication from communication  
3 module 254.

4 As such, referring now to Figure 18, an illustrative flow diagram representing  
5 diagnostic module 316 is depicted. As shown, a user is asked to select whether they wish  
6 to update their product, as depicted by decision block 440. Alternatively, communication  
7 module 254 may automatically recognize that the exercise device or product is to be  
8 updated, therefore eliminating block 440 from the flow diagram. In the event that the user  
9 wishes to update the exercise device or product, communication module 254, and more  
10 specifically diagnostic module 316, connects directly to user module 252a-252n via  
11 network 16 (Figures 1 and 10), as depicted by block 442. Such connection may be  
12 achieved by a variety of manners, as known by one skilled in the art and also discussed  
13 herein. Upon connecting to user module 252a-252n or product, diagnostic module 316  
14 verifies that particular hardware and/or software modules are contained therein, as shown  
15 by block 444. In the event that software or read/write hardware may be updated, the  
16 necessary executable file is either streamed or downloaded to user module 252a-252n, as  
17 referenced by block 446. Upon receiving the downloadable file, user module 252a-252n  
18 executes the executable file to update the hardware and/or software components therein, as  
19 referenced by block 448. Alternatively, such as in system 10 (Figure 1), the downloadable  
20 file may be downloaded to computer 14 which may execute the program and update  
21 treadmill 12 remotely.

22 Referring again to decision block 440, when the user answers in the negative, the  
23 user is subsequently queried as to whether they are having difficulty with their exercise  
24

1 device or product, as identified decision block 450. Upon answering in the affirmative,  
2 diagnostic module 316 queries the user, as depicted by block 452, as to the difficulties they  
3 are having and what attempts if any, they have made to resolve the problem. Upon  
4 gathering the necessary information, diagnostic module 316 connects to the exercise device  
5 or other device, as depicted by block 454, and thereafter analyzes the various hardware and  
6 software problems to resolve and identify whether it is possible to remotely fix the  
7 problem, as depicted by blocks 456 and 458. In the event that the exercise device or  
8 device may be remotely corrected, through an update, as depicted by decision block 460,  
9 diagnostic module 316 will then perform the steps of updating as previously described in  
10 block 442, 444, 446, and 448. Alternatively, if the problem may not be corrected through  
11 remote access, diagnostic module 316 may automatically schedule a time for physical  
12 maintenance of the device or product. It may be appreciated by one skilled in the art, that  
13 various other functionality may be performed by diagnostic module 316.

14 In an alternate configuration, when user module 252 (Figure 10) is placed in the  
15 active status (e.g. turned on) user module 252 may optionally analyze its internal hardware  
16 and/or software modules to verify that such modules are operating correctly. In the event  
17 that one or more problems occur, diagnostic module 316 answers decision block 440 in the  
18 affirmative, thereby automatically obtaining an update from communication module 254  
19 (Figure 10) or alternatively manually requesting information from the user. Optionally,  
20 when a user of user module 252 accesses communication module 254 (Figure 10)  
21 communication module 254 activates diagnostic module 316 (Figure 12) to analyze user  
22 module 252.

1 In still another alternate configuration, communication module 254 remotely  
2 monitors various operating parameters of user module 252. For instance, such parameters  
3 can include, but are not limited to, operating parameters of the tread base, the belt, usage of  
4 the treadmill, the individual exercising upon the treadmill, voltage, current, and power  
5 usage and efficiency associated with the components of user module 252, and the like.  
6 Communication module 254 can analyze such parameters and consequently vary any  
7 number of operating parameters of user module 252 to resolve problems with user module  
8 252, aid the exercising user to perform an effective exercise workout, request an individual  
9 or entity to repair or check user module 254 for problems, or the like.

10 Referring again to Figure 12, according to another aspect of the present invention,  
11 communication module 254 enables a user to prepare a personalized audio and/or video  
12 exercise program. Communication module 254, therefore, includes program creation  
13 module 318. Program creation module 318, referring now to Figure 19, enables a user to  
14 select an audio program session, as depicted by decision block 470 and/or a video program  
15 session, as depicted by decision block 478. In the event that only an audio program  
16 session is desired, the user initially selects the type of exercise device that the program is to  
17 be used, such as but not limited to treadmills, cycles, steppers, hikers, climbers, Nordic  
18 style devices, ellipticals, and the like, as represented by block 472. Upon selecting the type  
19 of device, the user may then select a specific type of music, such as rock, pop, country,  
20 jazz, classical, alternative, or the like, that is to be used with the exercise program, as  
21 represented by block 474. Once a particular music type is selected, the user may then  
22 generate an exercise profile that the exercise device will follow during the exercise  
23 program, as depicted by block 476. Generation of the exercise profile may include  
24

1 defining one or more operating parameters of the exercise device, such as the speed and  
2 inclination of the tread base for a given period of time. Upon finalizing the exercise  
3 program, the user may then store the program, as represented by block 488, such as in their  
4 mailbox, on their exercise device, on a computer readable media, or the like.

5 In the case of a video program, the user again selects the particular type of exercise  
6 device to be used in association with the exercise programming, as represented by block  
7 480. Upon selecting the exercise device, the user may select a particular video  
8 presentation they desire, as represented by block 482. The video presentation includes any  
9 type of motivational programming known to those skilled in the art. For example, and not  
10 by way of limitation, the video presentation may include natural scenes, such as  
11 mountains, oceans, streams, and the like, exercising individuals, educational programming,  
12 abstract images, and the like. It is preferred that each video presentation includes a  
13 specific sound track; however, the user may modify a particular audio track that is  
14 synchronized with the video presentation or optionally generate a completely new audio  
15 track, according to block 484. Once the video program, and optional music program, is  
16 selected, the user may subsequently generate an exercise profile, as represented by block  
17 486, in a similar manner to that described above. As with the audio program, the video  
18 program may be stored for use at subsequent times, as depicted by block 488.

19 The presently described invention may be used in a variety of situations to enable  
20 individuals who wish to exercise to obtain more beneficial results in a highly motivated  
21 setting. With this in mind, following hereinafter is an illustrative embodiment of an  
22 environment within which the exercise devices and modules of the presently described  
23 invention may be used.

24

1 Referring again to Figure 12, communication module 254 includes an advertising  
2 module 320. Advertising module 320 is adapted to retrieve the information obtained by  
3 login-registration module 302 and retrieve from memory 194 or external memory 196  
4 (Figure 8) advertisements that may be appropriate for the user to view in light of the  
5 selections made during the login process. In one embodiment, an audio and video  
6 advertisement signal is delivered with the audio and video exercise programming to appear  
7 on user interface 262 (Figure 11). For example, a banner may appear on user interface 262  
8 (Figure 11), and more specifically video display 94 (Figure 6) for the user. Such  
9 advertising may, alternatively, may take the form of an additional streaming, real time  
10 audio and video output that is linked to one or more national advertising agencies. In such  
11 a case, the banner may optionally appear for a few seconds to present a micro-commercial  
12 targeted to the user of user module 252. Upon completing the commercial, the banner may  
13 disappear, to subsequently reappear with the same or alternatively different micro  
14 commercials at various periods along an exercise program.

15 Referring again to Figure 12, communication module 254 includes a links module  
16 322. Links module 322 is configured to provide the user with a list of various additional  
17 web sites where educational and exercise information, products, materials, and the like  
18 may be viewed and/or purchased.

19 With reference now to Figure 20, a master-slave system 500 is depicted that may or  
20 may not use the systems described above to enable communication between the various  
21 components of the master-slave system as will be described in detail hereinafter. Master-  
22 slave system 500 may use various types of network, such as the Internet to enable  
23 communication between the various portions of master-slave system 500. Master-slave  
24

1 system 500, in this embodiment, includes a master device 502 and one or more slave  
2 devices 504a-504n communicating with master device 502. In this embodiment, master  
3 device 502 may take the form of a treadmill with a computer integrally formed therein.

4 Alternatively, master device 502 may be a treadmill with one or more processors,  
5 controllers and memory storage devices that allow master device 502 to control one or  
6 more slave devices 504a-504n without entirely incorporating a computer therein. Master  
7 device 502, therefore, may or may not incorporate the structure and functionality of  
8 treadmill 20 (Figure 1) or other exercise device, communication module 254 (Figure 10),  
9 and/or trainer modules 256a-256n (Figure 10).

10 Generally, master device 502 enables an individual exercising thereupon to control  
11 one or more slave devices 504a-504n, in real-time, whether or not master device 502  
12 receives input data from the one or more slave devices 504a-504n. As depicted, master  
13 device 502 is directly linked with each of the slave devices 504a-504n via a  
14 communication line connection, such as but not limited to existing broadcast technology,  
15 including short range wireless transmissions, television broadcast over the airwaves, cable  
16 or cable modems, satellite, telephone lines, whether analog or digitally based, wireless  
17 technology, other high-speed data connections, or any other suitable transmission  
18 technology or medium. Master device 502, therefore, includes the appropriate hardware  
19 and/or software applicable to enable master device 502 to communicate and control one or  
20 more slave devices 504a-504n.

21 In one case, the internal components of master device 502, alone, are sufficient to  
22 enable communication to and control of slave devices 504a-504n. Therefore, master  
23 device 502 need not incorporate computer 14 (Figure 1), translator device 13 (Figure 1), or  
24

1 hardware and/or software modules of communication system 18, or communication  
2 module 254 therein. In another configuration, master device 502 may communicate with  
3 slaves 504a-504n via a network and a communication system or module so that master-  
4 slave system 500 has a similar configuration to system 250 where one or more trainer  
5 modules 256a-256n control the operation of one or more user modules 252a-252n via  
6 network 16, whether or not communication module 254 is used to facilitate such  
7 communication and control.

8 Each slave device 504a-504n and sub-slave device 506a-506n linked to master  
9 device 502 may take the form of an exercise device, such as treadmill 12, translator device  
10 13, and/or computer 14 of Figure 1. Additionally, each slave device 504a-504n may  
11 incorporate the structure and functionality of user modules 252a-252n. Each slave device  
12 504a-504n, therefore, may be controlled by master device 502 in real-time while enabling  
13 the user to manually override the operation of the exercise device in opposition to control  
14 signals received from master device 502.

15 As illustrated in Figure 20, each slave 504a-504n may optionally be a master to  
16 subsequent sub-slave device 506a-506n, as shown in broken lines. In such a manner,  
17 various exercise devices may be separated into different groups. For example, slave 504a  
18 may receive a beginner level control signal from master 502. In turn, slave 504a may  
19 control the operation of one or more sub-slave devices 506a-506n that are operated by one  
20 or more beginners. Similarly, slave 504b may receive an intermediate level control signal  
21 from master 502 and subsequently control one or more sub-slaves (not shown), while slave  
22 504n may receive an advanced level control signal from master 502 and subsequently  
23 control one or more sub-slaves (not shown).

1 According to another alternate configuration, master device 502 may receive  
2 information from each slave device 504a-504n representative of the user's heart rate, blood  
3 pressure, and the like. Master device 502 may, therefore, modify each slave device 504a-  
4 504n or sub-slave device 506a-506n, whether individually or collectively, based upon the  
5 data received from the user. For example, if the user's heart rate is too high, master device  
6 502 may automatically reduce one or more operating parameters of the exercise device,  
7 such as speed, incline, resistance, and the like.

8 In summary, although it is preferred that the communications performed according  
9 to the present invention (e.g., the first signal and the second signal) be in real time, it is  
10 also possible to achieve many objects of the present invention by engaging in  
11 communication other than real time.

12 Further, according to one aspect of the present invention, the devices disclosed  
13 herein can incorporate various audio/video features into the device or exercise device itself  
14 rather than having external audio/video features connected thereto. The exercise devices  
15 can also include sensors that track the activity level of an individual on the exercise device  
16 and consequently determine whether the user is actually exercising or is old enough to be  
17 using the exercise device.

18 Additionally, the devices of the present invention allow one or more users to  
19 exercise in a group setting, while being distantly located one from another. Furthermore,  
20 the present invention enables home exercise equipment users to interact with trainers, other  
21 users, physical therapists, physicians, and the like in live-on-live workout sessions and, in  
22 some situations, allow a trainer, physical therapists, physicians, and the like to control at  
23 least one operating parameter of the exercise device upon which the user is training.  
24

1 To enable the above-described communication, a user may access a communication  
2 system or module that facilitates communication between one or more users, trainers, or  
3 third parties. Such communication system or module may include at least one web site  
4 with associated web pages. As a user accesses the communication system or module,  
5 statistical information related to an individual's workout regime, such as how much time  
6 an individual spends on each various exercise device, the locations where they trained,  
7 when each user accesses the communication system or modules, and the like is gathered.

8 Generally, the communication system or module, and hence the web site, may  
9 enable a user to access information and programming contained therein. In one  
10 embodiment, the communication system or module has the ability to control at least one  
11 operating parameter of the device or exercise device via the web site and web pages. In  
12 one case, when a user activates one or more input devices, such as a touch sensitive screen  
13 having a visual representation of the web page thereon, the communication system or  
14 module, via the web site, changes the operational parameters of the device or exercise  
15 device. The same web site provides access to various exercise programming. For  
16 example, the user may select live or recorded programming or select competitive  
17 motivational content. Such competitive motivational content allows an individual to  
18 compare the amount of miles traveled on an exercise device against individuals throughout  
19 the world engaging in similar activities. Therefore, competitors around the world may race  
20 against one another. Optionally, two or more users may link their exercise devices directly  
21 without the need to communicate through the communication system or module.

22 Another type of motivational content may include one or more electronic  
23 magazines or books that a user may download to view while exercising. Yet another type  
24

1 of motivational content or programming relates to the ability of the user to view an  
2 exercise profile representative of the exercise program currently being performed by the  
3 user. Such profile may be displayed to the user continuously, periodically, or other under  
4 the control of the user and/or the communication system or module. In one configuration,  
5 the exercise profile may appear and overlay the visual image that the user is watching,  
6 whether the visual image is a television broadcast, webcast, or the like.

7 Another type of motivational content relates to various advertisements. During the  
8 exercise program a user may receive commercial advertising through an advertising banner  
9 that may continuously or periodically appear on the video display. Optionally, the  
10 advertisement may appear in a picture-in-picture advertisement that is delivered to the user  
11 as a micro-commercial that is displayed to the user and subsequently removed.

12 As implied above, the programming received from the communication system or  
13 module may be live or recorded. In some situations the live programming received by the  
14 user may be too difficult or not difficult enough for the user of the exercise device. The  
15 present invention provides scaling controls that allow the user to scale the signals received  
16 from the communication system or module and/or the trainer. In this manner, the  
17 exercising user may increase or decrease the intensity of the exercise program. Such  
18 scaling may be achieve either at the user device, trainer device, the communication system  
19 or module, or at some other third party modules that may control the operation of the  
20 user's exercise device. By selecting a particular option on the web page, the user's  
21 appliance will be controlled according to the scaled choice. Optionally, the user may  
22 define a maximum limited for one or more of the operating parameters of the device, such  
23  
24

1 that transmitted programming is limited in accordance with the maximum values defined  
2 for each operating parameter.

3 According to another aspect of the present invention, the systems, devices, and  
4 modules of the present invention enable bi-directional communication between one or  
5 more user devices and one or more trainer devices. The communication system or module  
6 of the present invention may retrieve information from the devices and/or exercise devices  
7 and evaluates the operating parameters of the device and/or exercise device. The  
8 communication system or module may analyze any measurable parameter of the device or  
9 exercise device and may optionally analyze any measurable parameter of a user exercising  
10 using the exercise device. In response to this analysis, the communication system or  
11 module prescribes a particular action for the device or exercise device to perform, such as  
12 changing the speed of a treadmill, inclination of a treadmill, and the like. In this manner,  
13 the exercise device is capable of being controlled by signals from the communication  
14 system or module.

15 Similarly, the exercise device can be controlled by physical controls integrated onto  
16 the device or exercise device. The physically integrated controls and the control signals  
17 from the communication system or module can be passed through a buffer that controls the  
18 exercise device or device. In this way, in the event that connectivity to the communication  
19 system or module is lost, a user of the device or exercise device is still capable of  
20 controlling the device or exercise device.

21 In additional to control signals, communication system or modules can remotely  
22 update various portions of a device or exercise device according to the need or direction of  
23 the user of the device or as determined by the communication system or module. For  
24

1 example, communication system or module may change any and all parameters related to  
2 the device or exercise device, such as the BIOS, or some other software. This can be  
3 achieved automatically or through use of a diagnostic button. Upon activation of the  
4 diagnostic button, the internal hardware and/or software components of the device or  
5 exercise device, solely, or in combination with the communication system or modules tests  
6 and checks the various hardware and/or software modules, components, or elements of the  
7 device or exercise device. If any problems are found the internal hardware and/or software  
8 components of the device or exercise device, solely, or in combination with the  
9 communication system or modules attempt to fix the problems. Additionally, the  
10 diagnostic button may activate a downloading sequence to update information on the  
11 appliance with new software from a central database, such as at communication system or  
12 module.

13 As discussed previously, the diagnostic button is one example of an interface to  
14 allow a user to access the communication system. The present invention can include other  
15 interfaces that can communicate with existing hardware and/or software components of  
16 various existing devices and exercise devices. As such, those devices or exercise devices  
17 not currently capable of communicating with communication system or module, can be  
18 retrofitted with various hardware and/or software modules as described herein to allow the  
19 exercise device or device to communicate with the communication system or module.

20 In addition to operating alone, a number of the devices of the present invention can  
21 be used in a master-slave system. In such a system, changes to the operating parameters of  
22 the master are translated to the operating parameters of the slave, thereby controlling the  
23 operation of the device or exercise device. For example, in a spinner class, upon activation  
24

1 of a more intense riding experience by the master, the slave spinners also give their riders a  
2 similarly intense riding experience. The master may selectively choose groups of  
3 participants based on various criteria, such as participant's heart rates, and change those  
4 participants exercise program, while maintaining other participants at the original or  
5 different exercise level.

6 Referring now to Figures 21-25, depicted is another illustrative system, designated  
7 by referenced numeral 600, that may incorporate the novel features of the present  
8 invention. The majority of the features and elements of system 600 are similar to those  
9 referenced with respect to system 10, and system 250. Subsequently, like elements,  
10 features, or devices are designated with like reference numerals.

11 As shown, an exercise mechanism, such as treadmill 12 is in communication with a  
12 trainer (not shown) at treadmill 20 via optional personal computer 14. Alternatively,  
13 treadmill 12 may communicate with a trainer at communication system 18 or third-party  
14 21, either directly via network 16 or through personal computer 14 and network 16.  
15 Although not depicted in Figure 21, one skilled in the art can appreciate that treadmill 12  
16 can communicate with communication system 18 via translator device 13 (Figure 1) and  
17 computer 14, as described previously.

18 Generally, system 600 allows a user of treadmill 12 to download exercise programs  
19 stored at communication system 18, treadmill 20, or third party 21 for use in the  
20 performance of an exercise workout. These programs can include motivational content  
21 with optional control signals that control the operation of treadmill 12. The control signals  
22 may or may not be synchronized with the motivational content based upon the particular  
23 motivational content and downloadable exercise program. Therefore, each program can  
24

1 include an audio representation of a trainer performing an exercise workout, while  
2 providing encouragement and other motivational support, and/or control signals that vary  
3 one or more operating parameters of treadmill 12.

4 As illustrated, system 600 includes a portable system 602. Portable system 602 can  
5 download exercise programs from one or more of the other systems or devices of system  
6 600. For example, portable system 602 can download motivational content with associated  
7 control signals from communication system 18 through network 16 and personal computer  
8 14. Although it is desirable that the motivational content includes synchronized control  
9 signals, one skilled in the art can appreciate that portable system 602 can receive  
10 motivational content without control signals, control signals without motivational content,  
11 or asynchronous motivational content and control signals.

12 As shown, portable system 602 can communicate directly with treadmill 12 and  
13 computer 14 to gain access to communication system 18. Further, as illustrated in Figure  
14 21, portable system 602 can directly communicate with network 16 to access  
15 communication system 18, treadmill 20, or third-party 21 when portable system 602 has  
16 Internet capabilities, such as when portable system 602 is a personal digital assistant, a  
17 palm computer, a mobile or wireless telephone, or the like.

18 In addition to downloading exercise programs, portable system 602 can upload to  
19 communication system 18, treadmill 20, and/or third-party 21 data specific to the user of  
20 treadmill 12. For instance, portable system 602 can upload data representative of any  
21 measurable parameter of the treadmill user to personal computer 14, communication  
22 system 18, treadmill 20, or third party 21 of system 600. Such data can be representative  
23 of, but not limited to, the user's heart rate, user's blood pressure, distance traveled by the  
24

1 user, period of time which the user exercises, and the like. Similarly, portable system 602  
2 can upload data representative of any measurable parameter of the exercise device, i.e.,  
3 treadmill 12. Such data can include, but not limited to, speed or inclination of the belt,  
4 operating status of the components and modules of treadmill 12, and the like.

5 Whether the data represents operating parameters of the exercising user or treadmill  
6 12, this data can be stored at communication system 18 for analysis by a trainer either  
7 alone or in combination with modules and components of treadmill 20, and third party 21.  
8 Consequently, the trainer either alone or in combination with the modules and components  
9 of communication system 18, third party 21 can prepare a user specific exercise program  
10 that can be downloaded to the user of treadmill 12.

11 By providing access to a trainer, portable system 602 facilitates the performance of  
12 an exercise program by the user of treadmill 12. Further, portable system 602 provides a  
13 user with the functionality associated with an iFit compatible exercise mechanism, as  
14 discussed herein, when the exercise mechanism upon which the user is exercising is iFit  
15 incompatible, i.e., portable system 602 allows a user to access the iFit.com website 300  
16 (Figure 11) hosted on communication system 18, download an exercise program, and  
17 perform the exercise program in accordance with the motivational content, without the  
18 need to own or have access to a treadmill that can communicate with communication  
19 system 18. In this manner, a user can experience an iFit experience with a user's existing  
20 exercise mechanism or equipment.

21 Referring now to Figure 22, a more detailed representation of one illustrative  
22 portable system 602 of the present invention is depicted. Portable system 602 includes a  
23 control device 604, an audio delivery device 606, and a sensing device 608. Although each  
24

1 of these devices 604, 606, and 608 are illustratively separated one from another, various  
2 other configurations of the present invention can incorporate all or a portion of device 604,  
3 606, and 608 into a single device.

4 Control device 604 of portable system 602 is configured to download and deliver  
5 exercise programs to an exercising user and upload retrieved exercise data to personal  
6 computer 14, communication system 18, treadmill 20, and/or third party 21. The  
7 downloaded exercise program and retrieved exercise data can be stored within control  
8 device 604 on a storage medium 621, whether removable or not, such as but not limited to  
9 a ASIC chip, programmable ROM, CD-ROM, EEPROM, PCMCIA card, a recordable  
10 integrated circuit (IC) termed a memory stick, compact flash card, flash bios, dynamic  
11 memory, magnetic storage disk, optical storage media, or the like.

12 The stored exercise program, in this illustrative configuration, can include  
13 motivational content and control signals that operate treadmill 12 in synchronization with  
14 the motivational content. For instance, the motivational content can be an audio program  
15 having one of a variety of formats, such as a MP3 file, a wave file, an audio file, a MIDI  
16 file, and the like. Similarly, the control signals forming part of the exercise program can  
17 be audible or inaudible signals that cause a change in one or more of the operating  
18 parameters of treadmill 12, such as in the manner discussed previously.

19 As can be appreciated by one skilled in the art, the exercise program can be devoid  
20 of control signals, thereby allowing the user to manually manipulate the controls of  
21 treadmill 12. Alternatively, the exercise program can include the control signals, while the  
22 user can manually override the changes initiated by the control signals. Similarly, when  
23 the exercise mechanism is not iFit compatible or not capable of being controlled by the  
24

1 control signals, the control signals will have no effect on the exercise mechanism,  
2 consequently allowing the user to manipulate the operation of the exercise mechanism. In  
3 still another configuration, the exercise program can only include control signals with no  
4 motivational content, such as when the motivational content is delivered to control device  
5 604 as a separate file written or stored on a storage medium.

6 As illustratively shown in Figure 22, control device 604 includes buttons 614a-  
7 614e, ports 616, 618, and 620 and a display 622. Each button 614a-614e and port 616,  
8 618, and 620 is considered an input device or means for inputting data into control device  
9 604. In some embodiments, display 622 is also an input device, such as when display  
10 device 620 is a touch sensitive input device or other similar display device that allows a  
11 user to input data into control device 604 or otherwise causes control device 604 to  
12 perform the desired function.

13 Each button 614a-614e allows a user to initiate or activate different functionality of  
14 control device 604 and system 600. For instance, one button, such as 614a can power  
15 control device 604 into an "on" or operational status, while another button 614e can place  
16 control device 604 into an "off" or inoperable status. Further, other buttons can: (i) begin  
17 the delivery of motivational content and/or control signals to treadmill 12; (ii) initiate  
18 storing or downloading of motivational content and/or control signals to control device  
19 604; (iii) receive data representative of any measurable parameter detected by sensing  
20 device 608, audio delivery device 606, or one or more sensors coupled or communicating  
21 with treadmill 12; (iv) deliver motivational content to audio delivery device 606; (v)  
22 display information or data associated with the motivational content, the control signals, or  
23 any of the measurable parameters of the exercising user or the exercise device; (vi) and the  
24

1 like. Other functionality associated with control device 604 and system 600, known by  
2 one skilled in the art, can be initiated or activated through buttons 614a-614e.

3 Although reference is made to “buttons” to perform the above-recited functionality,  
4 portable system 602 can incorporate various other actuators to cause or initiate the  
5 functionality of portable system 602 and system 600. For instance, such actuators can  
6 include one or more switches, rheostats, potentiometers, touch sensitive controls, voice  
7 activated controllers, and the like.

8 As shown in Figure 22, control device 604 includes ports 616, 618, and 620. Port  
9 616 is configured to allow control device 604 to communicate with audio delivery device  
10 606. Subsequently, the particular type of port forming port 616 can vary based upon the  
11 configuration of audio delivery device 606. For instance, port 616 can accommodate an  
12 audio jack, such as but not limited to an RCA-type audio jack, and the like. Alternatively,  
13 control device 604 and audio delivery device 606 can be linked via a connectionless link,  
14 such as by a radio frequency (RF), infrared (IR), or other wireless-type communication line  
15 connection, with port 616 having the form of a transmitter and/or receiver of the  
16 appropriate electromagnetic radiation.

17 Port 618 is configured to allow control device 604 to upload and download data  
18 from treadmill 12, personal computer 14, and/or communication system 18, treadmill 20,  
19 or third party 21. For instance, port 618 can received data representative of any  
20 measurable parameter of treadmill 12 that is detected by one or more sensors formed in  
21 treadmill 12 as discussed herein. Further, port 618 can transmit control signals to treadmill  
22 12, such as those synchronized with the motivational content stored in control device 604.  
23 Consequently, port 618 can create a physical connection or a connectionless connection  
24

1 with the other modules, components, devices, and systems of system 600. For instance, as  
2 illustrated in Figure 22, port 618 is a wireless or connectionless type port that represents an  
3 electromagnetic radiation transmitter and receiver. Optionally, the present invention can  
4 include two ports; one acting as a transmitter and one acting as a receiver.

5 Port 620 of control device 604 is configured to allow a removable storage element  
6 621 to be inserted therein. For example, port 620 can accommodate a memory stick,  
7 which can store the programs downloaded from communication system 18 and/or the  
8 exercise data retrieved from the exercising user and/or treadmill 12 in a variety of formats.  
9 It can be appreciated that port 620 can have various other configurations depending on the  
10 particular removable storage associated with control device 604. For instance, port 620  
11 can accommodate optically read media, magnetically read media, and the like.

12 As shown, control device 604 includes display 622, such as a liquid crystal display  
13 (LCD). Display 622 acts as an output device that provides information and data to a user,  
14 such as the available battery power level, time remaining until the completion of the  
15 exercise workout, quantity of storage available or used, and the like. Consequently,  
16 display 622 can have various other configurations, such as but not limited to, an  
17 electroluminescent display (ELD), a gas-plasma display, a thin film transistor (TFT)  
18 display, and the like. Alternatively, display 622 can be remote from control device 604  
19 while communicating with control device 604. For instance, display 622 can be a virtual  
20 reality (VR) display, cathode ray tube (CRT), and the like. In another configuration,  
21 display 622 can act as an input device when display 622 is a touch sensitive control.

22 Communicating with control device 604 is audio delivery device 606. Generally,  
23 audio delivery device 606 is configured to deliver motivational content stored within  
24

1 control device 604 to the exercising user of treadmill 12. Audio delivery device 606,  
2 therefore, can include one or more speakers that provide audio representations of the  
3 motivational content directly to the user. For example, as shown, audio delivery device  
4 606 is in the form of a headset 624, having speakers 626, which may be worn by the user.

5 Audio delivery device 606 can communicate with portable system 602 via a variety  
6 of different types of communication line connection. As illustrated in Figure 22, audio  
7 delivery device 606 includes an audio jack that engages with port 616 included within  
8 portable system 602. Such an audio jack can be an RCA-type audio jack, and the like.  
9 Alternatively, control device 604 and audio delivery device 606 can be linked via a  
10 connectionless link, such as by a radio frequency, infrared, or other wireless-type  
11 communication line connection.

12 It can be appreciated by one skilled in the art, that various other configurations of  
13 audio delivery device 606 are capable of performing the desired function. For example,  
14 instead of delivering audio signals to the user via both ears, the audio signals can be  
15 delivered to only one of the user's ears. Further, audio delivery device 606 need not be  
16 worn by the user, such as on the user's clothing, belt, head, or the like, but can take the  
17 form of a speaker formed in control device 604 or in a speaker remote from control device  
18 604 and/or treadmill 12. For instance, control device 604 can communicate directly with  
19 audio and/or video equipment typically available within a user's home, at a gym, at some  
20 other exercising location, and the like.

21 According to another aspect of the present invention, audio delivery device 606  
22 includes a sensor 630. Sensor 630, in this illustrative configuration, includes two contacts;  
23 a first contact 632a and second contact 632b. Sensor 630 is configured to track any  
24

1 measurable parameter of the exercising user, such as but not limited to, pulse or heart rate,  
2 blood pressure, calories burned, distance traveled, and the like. As illustrated, sensor 630  
3 is a typical IR pulse sensor that uses first contact 632a and second contact 632b to track the  
4 pulse of the user via the user's ear. In this manner, sensor 630 can detect exercising data or  
5 information of the exercising user. Consequently, audio delivery device 606 can deliver  
6 the collected data to control device 604 for future use, i.e., uploading such data or  
7 information to communication system 18, treadmill 20, third-party 21, and the like.

8 The inclusion of sensor 630 within audio delivery device 606 is an advance over  
9 the existing manners of obtaining the pulse rate or other physical data related to an  
10 exercising user. Particularly, incorporating sensor 630 or some other means for measuring  
11 any measurable parameter of the exercising user into a wearable headset, reduces the  
12 discomfort typically associated with obtaining such data or information. For example,  
13 many existing pulse rate sensors use clip-type sensors that apply a degree of pressure or  
14 force to that particular area of the patient's body, such as the ear or finger. The inclusion  
15 of sensor 630 and associated first contact and second contact 632a, 632b reduces the  
16 compressive force typically applied when determining user's pulse rate, and consequently  
17 reduces the discomfort that a user has to endure.

18 Although it is preferred to include sensor 630 within headset 624, one skilled in the  
19 art can understand that the present invention can utilize various other types of sensor,  
20 including the clip type sensors, to track various measurable parameters of the exercising  
21 user.

22 As mentioned above, portable system 602 can optionally include sensing device  
23 608. The sensing device 608 tracks the performance of the user during a workout, such as  
24

1 sensing the acceleration or speed of the user, the distance traveled by the user during an  
2 exercise workout, and any other measurable parameter of the user. Consequently, sensing  
3 device 608 can be an accelerometer, pedometer, combination thereof, or other sensing  
4 device capable of tracking any measurable parameter of the exercising user. For instance,  
5 sensing device 608 can track blood pressure, heart rate, calories burned, and the like in a  
6 similar manner to sensor 630.

7 Typically, tracking one or more measurable parameters is achieved by coupling  
8 sensing device 608 to the patient, such as via the user's clothing, belt, or the like.  
9 Alternatively, sensing device 608 can be directly attached to the user's skin or via a  
10 combination of skin and clothing contact, such as when the user holds sensing device 608.  
11 As sensing device 608 gathers the measurable data associated with the exercising user,  
12 sensing device 608 downloads or transmits such data to control device 604. In this  
13 configuration, therefore, a connection is created between sensing device 608 and control  
14 device 604 to allow data transmission therebetween. For example, such a connection can  
15 take the form of a connectionless connection, i.e., an IR connection, RF connection, or  
16 some other wireless-type connection or alternatively a physical connection, such as  
17 through one or more conductive wires, optical fibers and the like.

18 The various devices forming portable system 602 can have various other  
19 configurations as known by one skilled in the art. For instance, in another configuration,  
20 sensing device 608 and sensor 630 can be incorporated within control device 604, such that  
21 control device 604 both gathers and stores any measurable parameter or data related to the  
22 exercising user or the exercise device. Consequently, control device 604 can include an  
23 accelerometer, a pedometer, combinations thereof, or some other sensing device 608.  
24

1 Therefore, the use of the term “sensor” incorporates any sensing device that can track any  
2 measurable parameter of a user or a device upon which the user is exercising, such as  
3 treadmill 12.

4 In another configuration, portable system 602 can include control device 604 and  
5 sensing device 608, while using audio and/or video delivery devices commonly existing in  
6 a users’ home, such as televisions, radio transceivers, removable storage devices, optically  
7 read or magnetic media players, and the like.

8 Referring now to Figure 23, a schematic representation of portable system 602 is  
9 illustrated. As shown, control device 604 communicates with audio delivery device 606  
10 and optionally sensing device 608 as before. As shown, control device 604 includes a user  
11 display 640 and a user interface 642. The user display 640 provides a visual representation  
12 of data associated with the exercising user. For instance, user display 640 can display the  
13 current distance traveled, the calories burned, time remaining to completion of the exercise  
14 program, the amount of the exercise program performed, and the like. User display 640,  
15 consequently, can have a similar configuration to display device 622 described herein.

16 User interface 642 allows a user to input instructions and facilitate initiating or  
17 activating an exercise program stored within data storage 646 of control device 604. The  
18 user interface 642 further provides a manner for the user to cause uploading and  
19 downloading of information to and from treadmill 12, computer 14, communication system  
20 18, treadmill 20, and/or third party 21. Various user interfaces are applicable and known  
21 by one skilled in the art, such as but not limited to, buttons, switches, potentiometers, voice  
22 activated interfaces, touch sensitive interfaces, and the like. Optionally, as illustrated by  
23 dotted lines, user display 640 and user interface 642 can be incorporated into the same  
24

1 device or interface, such as when user display 640 is a touch sensitive video display or  
2 other similar device.

3 Communicating with user display 640 and user interface 642 is processor 644.  
4 Processor 644 controls the delivery of exercise programs and exercise data representative  
5 of any measurable parameter of the exercising user and/or treadmill 12 (Figure 21) to and  
6 from computer 14, communication system 18, treadmill 20, and/or third party 21. Further,  
7 processor 644 controls the flow of data, whether exercise program data or data  
8 representative of any measurable parameter of the exercising user and/or treadmill 12  
9 (Figure 21) between the devices and components of portable system 602.

10 Generally, processor 644 can include one or more micro-controllers, central  
11 processing units, state machines, programmable logic arrays, network logical arrays, or  
12 gates, ASIC processors, software-based controllers, combination logic, combinations  
13 thereof, and a variety of other controllers known by one skilled in the art to manipulate  
14 data transceived between one or more of the components or devices of portable system 602  
15 and system 600.

16 Data storage 646 communicates with processor 644. Data storage 646 can have  
17 various configurations known to one skilled in the art. For example, data storage 646 can  
18 be fixed within control device 604 and alternatively can be removable insertable within  
19 control device 604. Therefore, data storage 646 can be a removable magnetic media,  
20 optical media, memory stick, or the like. Further, data storage 646 can be one or more  
21 flash memory cards, RAM, ROM, programmable RAM or ROM, and the like. Generally,  
22 data storage 646 is configured to store exercise programs with motivational content and/or  
23 control signals received from communication system 18, e.g., the iFit website, the exercise  
24

1 data obtained from sensor 630 of audio delivery device 606 and sensing device 608, and  
2 any measurably parameter of the user and/or the treadmill sensed by one or more different  
3 sensors coupled to the user and/or the treadmill.

4 According to another aspect of the present invention, control device 604 includes  
5 an interface 648. Interface 648 allows control device 604 to communicate with audio  
6 delivery device 606 and sensing device 608. Therefore, interface 648 performs the  
7 functions of port 616 and optionally 618 described above with respect to Figure 22. It can  
8 be understood that the functionality of interface 648 can be executed by a plurality of  
9 interfaces. For instance, interface 648 can include an audio interface and a data interface.  
10 The audio interface being capable of transceiving data between control device 604 and  
11 audio delivery device 606 in an audio format, while the data interface transceives data  
12 between control device 604 and sensing device 608 and optionally treadmill 12, computer  
13 14, communication system 18, treadmill 20, and third party 21. Consequently, interface  
14 648 can have various configurations as known by one skilled in the art in light of the  
15 teaching contained herein.

16 Optionally, interface 648 can communicate with treadmill 12 to deliver control  
17 signals and receive data representative of any measurable parameter of treadmill 12.  
18 Further, interface 648 can facilitate communication between portable system 602 and  
19 communication system 18.

20 As illustrated in dotted lines, control device 604 can optionally include one or more  
21 sensors or sensing devices 650. For example, when control device 604 incorporates the  
22 functionality of sensing device 608 or sensor 630, control device 604 includes the various  
23 components of sensing device 608 and/or sensor 630. Similarly, when control device 604  
24

1 partially or completely incorporates audio delivery device 606, control device can include  
2 sensors 630 (Figure 22).

3 Communicating with control device 604 is audio delivery device 606. Audio  
4 delivery device 606 includes an appropriate interface 652 to allow communication between  
5 control device 604 and audio delivery device 606. For example, interface 652 can take the  
6 form of one or more audio jacks, as discussed herein, or other interfaces so long as such  
7 interfaces are complementary to those of control device 604.

8 Further, as mentioned above, audio delivery device 606 can include (i) one or more  
9 audio outputs 654, such as but not limited to two speakers (Figure 22); (ii) one or more  
10 sensors 656 for sensing measurable parameters of the exercising user; (iii) one or more  
11 processors 658 that manage the delivery of audio signals or data between control device  
12 604 and audio delivery device 606 and facilitates the delivery of exercise data tracked by  
13 sensor 656; and (iv) a data storage 660 for storing audio signals or data and the data  
14 representative of the measurable parameter sensed by sensor 656. Each of the above can  
15 have a similar configuration to the interfaces, audio outputs, processors, sensors, and data  
16 storages discussed herein. Generally, each of the above can have various other  
17 configurations known to one skilled in the art in view of the teaching contained herein.

18 Optional sensing device 608, as illustrated, includes an interface 670 that assists  
19 with the transmission of sensed data to control device 604, and subsequently to  
20 communication system 18. As with audio delivery device 606 sensing device 608 includes  
21 at least one processor 672, at least one data storage 674, and at least one sensor 676.  
22 Sensor 676 of sensing device 608 typically tracks different measurable parameters of the  
23 user than those parameters sensed by sensor 630 (Figure 22) or sensor 656. Although this  
24

1 is typically the case, one skilled in the art can appreciate that sensor 676 can sense the  
2 same measurable parameter as those sensed by sensor 656.

3 Generally, portable system 602 can be used in a variety of manners to provide a  
4 user with motivational content and optional access to iFit website 300 (Figure 12). In one  
5 configuration, a user connects control device 604 to personal computer 14. Subsequently,  
6 control device 604 through computer 14 accesses communication system 18, treadmill 20,  
7 or third-party 21 and hence accesses iFit website 300. The user, therefore, can obtain  
8 audio exercise programs from iFit website 300 in a manner similar to that described above.

9 For example, once a user connects to iFit website 300, and optionally logs in, the  
10 user can review the available audio programs and download one or more audio program  
11 files from audio program module 304 (Figure 14). As a user selects the audio program  
12 files, the user optionally specifies the type of exercise device being used. Consequently,  
13 communication system 18 displays audio program files specific to the type of exercise  
14 mechanism or equipment available to the user. The user can then download a copy of the  
15 motivational content, such as in an MP3, WAV, AU, MIDI, or other formats, optionally  
16 with control signals.

17 Depending on the particular configuration of the present invention and the  
18 capabilities of portable system 602, either personal computer 14 or control device 604 can  
19 retrieve the downloaded audio program file and store the same in data storage 646.  
20 Consequently, control device 604 can optionally directly communicate with  
21 communication system 18, such as when control device 604 can access network 16  
22 remotely or otherwise create a connection with communication system 18, i.e., a wireless  
23 connection to the Internet, or the like. In the case where personal computer 14 downloads  
24

1 the program file, a user can cause control device 604 to communicate with personal  
2 computer 14 to retrieve the audio program file or optionally retrieve a removable data  
3 storage component, such as an MP3 cartridge or memory stick from personal computer 14  
4 and insert the same into control device 604.

5 Once the file has been retrieved and is accessible by control device 604, whether  
6 the exercise program is stored within a removable data storage component of control  
7 device 604 or in non-removable data storage of control device 604, the user can begin to  
8 exercise on treadmill 12 in accordance with the motivational content and optional control  
9 signals stored in the data storage.

10 For discussion purposes, let us assume that only motivational content is  
11 downloaded to control device 604. This is illustrative of the case where the available  
12 treadmill 12 is iFit incompatible. Consequently, the user accesses iFit website 300 (Figure  
13 12) through personal computer 14, which is not connected to treadmill 12, and manually  
14 operates the treadmill in accordance with the motivational content delivered to the user. It  
15 is understood, however, that an exercise program with only motivational content can be  
16 used with an iFit compatible treadmill, so long as the user manually controls the exercise  
17 mechanism and no connection is needed between treadmill 12 and communication system  
18 18 (Figure 21).

19 In the above described scenario, the user can exercise whether or not treadmill 12 is  
20 directly connected to iFit website 300. As the user exercises, sensor 630 tracks any  
21 measurable parameter of the exercising user, such as the pulse rate of the user.  
22 Substantially simultaneously with sensor 630 detecting the user's pulse rate, sensing  
23 device 608 tracks the speed and/or distance of the user during the exercise program or  
24

1 routine, while sensors included within treadmill 12 track one or more operating parameters  
2 of treadmill 12. As data is collected, sensing device 608, audio delivery device 606, and  
3 optionally treadmill 12 deliver such data to control device 604 where the data is stored in  
4 preparation for uploading to communication system 18, treadmill 20, and/or third-party 21.  
5 Optionally, sensing device 608, audio delivery device 606, and optional treadmill 12 can  
6 deliver the gathered data when the user has completed the exercise workout.

7       Following completion of the exercise program, the user can connect portable  
8 system 602 to personal computer 14, such as by inserting control device 604 into a cradle  
9 adjoining computer 14, by removal of a removable memory, via a wireless connection, or  
10 the like. Subsequently, the user can upload the exercise data to iFit website 300 where the  
11 data can be stored within the iFit website 300, and more specifically hardware and/or  
12 software modules associated with iFit website 300, such as in the user's personal storage of  
13 memory 278 (Figure 11). This stored information can be accessed by a personal trainer  
14 and thereafter analyzed, whether or not such analysis includes comparing the presently  
15 received exercise data with stored exercise. Following the analysis of the exercise data, the  
16 personal trainer can develop various other user-specific audio programs that the user can  
17 access when they next log onto iFit website 300. Such user-specific exercise programs or  
18 routines can be stored or optionally e-mailed to the user's mailbox 386 (Figure 16) and  
19 stored within data storage 390.

20       Alternatively, iFit website 300 can automatically analyze the exercise data  
21 uploaded from control device 604 to automatically develop other audio programs, update  
22 the distance traveled by the user during the exercise program to update information  
23  
24

1 associated with a race around the world competition, race against the computer, and/or race  
2 against specific other competitors.

3 In this manner, a user that owns an iFit incompatible exercise device can still obtain  
4 the benefits of using the iFit website 300 through portable system 602 whether alone or in  
5 combination with computer 14. In this manner, the user can be aided in performing  
6 exercise programs and routines and be motivated to exercise in the future.

7 In another configuration, portable system 602 can be used in connection with an  
8 iFit compatible treadmill 12. In this particular configuration, treadmill 12 is optionally  
9 disconnected from communication system 18, e.g., iFit website 300. In a manner similar  
10 to that described above, motivational content and control signals are retrieved from  
11 communication system 18 via personal computer 14. Following retrieval and downloading  
12 of the appropriate motivational content and other audio content, such as one or more  
13 control signals, control device 604 directly communicates with the iFit compatible  
14 treadmill 12, such as via one or more of the various input ports, such as port 102 or port  
15 104 or via a wireless, IR, RF connection through port 105 (Figure 6). In this manner,  
16 control signals are transmitted from control device 604, such as from port 618 (Figure 22)  
17 to treadmill 12 to operate treadmill 12 in a synchronized manner with the motivational  
18 content. The operation of treadmill 12 can be either synchronized or asynchronous to the  
19 motivational content delivered to the user through audio delivery device 606.  
20 Alternatively, audio output can be delivered to the users through speaker 96 on control  
21 panel 22 (Figure 6).

22 On completion of the exercise program or routine, or throughout the exercise  
23 program or routine, the exercise data received by sensing device 608 and/or sensor 630 can  
24

1 be delivered to iFit website 300, either directly through treadmill 12 or upon uploading  
2 such data through computer 14 to communication system 18. Optionally, control device  
3 604 can receive data representative of any measurable parameter of treadmill 12, such as  
4 speed, incline, distance traveled by the user, operational status of treadmill 12, problems  
5 with one or more components or modules of treadmill 12, and the like and deliver the same  
6 to communication system 18.

7 In still another configuration, such as when treadmill 12 is connected to  
8 communication system 18 via network 16, audio programming, optionally with associated  
9 control signals, either synchronous or asynchronous with the audio motivational content,  
10 can be downloaded from communication system 18 to treadmill 12 and subsequently  
11 downloaded to control device 604 via a wireless connection, physical connection, such as a  
12 serial, parallel, USB or the like connections, a combination thereof, or the like. In this  
13 manner, a user can download one or more exercise programs that can be used in  
14 association with either iFit or non-iFit compatible exercise equipment at various other  
15 locations.

16 According to another aspect of the present invention, the exercise programs  
17 retrieved and stored within control device 604 can be developed for use without an  
18 exercise mechanism currently owned by the user, but associated with an exercise  
19 mechanism at a health club or for use without any exercise mechanism, such as riding a  
20 bicycle, running, walking and the like. In this manner, the user is provided with various  
21 manners to obtain and exercise while tracking the exercise data associated with the user's  
22 workout.

1 Referring now to Figure 24, an alternate configuration of control device 604 is  
2 depicted. As illustrated, control device 680 includes a port 682 in the form of a plurality of  
3 contacts (not shown) that mate with a corresponding number of contacts 686 formed in a  
4 cradle 684. The cradle 684 can be in communication with computer 14 or treadmill 12,  
5 whether a physical connection, as represented by cable 689, or a connectionless connection  
6 to upload and download the data between communication system 18 and the various other  
7 systems, devices, and modules of system 600. Optionally, cradle 684 can be mounted to or  
8 integrally formed with treadmill 12. Although it is preferred that a number of contacts be  
9 used to allow communication between control device 680 and cradle 684, one skilled in the  
10 art can appreciate that a variety of different connections can be used, such as but not  
11 limited to, serial, parallel, USB, or a connectionless connection, for instance, wireless, IR  
12 and the like.

13 As shown, cradle 684 includes an activation button 688 that initiates the uploading  
14 or downloading of data to and from control device 680. It can be understood by one  
15 skilled in the art, however, that various other manners are applicable for initiating the  
16 delivery and receipt of data to and from control device 680. For instance, in an alternate  
17 configuration, upon insertion of control device 680 into cradle 684, a connection is  
18 automatically made between control device 680 and cradle 684 with treadmill 12,  
19 computer 14, communication system 18, treadmill 20, and/or third party 21.

20 Referring now to Figure 25, and alternative configuration of a control device,  
21 designated by reference numeral 690 is depicted. The majority of the features of control  
22 device 680 are the same as control device 604. Hence, like features of control device 690  
23 are designated by like reference numerals.

24

1 As illustrated, control device 690 has buttons 614a-614n, ports 618 and 620, and  
2 display 622. Further, control device 690 includes sensor 630, having contacts 632a, 632b  
3 positioned upon control device 690 in a manner to allow a user to contact such contacts  
4 632a, 632b using their fingers or thumb. Control device 690 further incorporates sensing  
5 device 608 and consequently includes an accelerometer, a pedometer, combinations  
6 thereof, or some other sensing device 608. One skilled in the art can identify various other  
7 configurations of control device 690 in light of the teaching container herein.

8 As used in this specification and the appended claims, the phrases “communicating  
9 with,” and “in communication with” and similar phrases can mean any type of applicable  
10 communication or communication line connection known to one skilled in the art in light  
11 of the disclosure herein, such as but not limited to electrical communication, optical  
12 communication, physical communication, wireless communication, magnetic  
13 communication, software communication, hardware communication, data communication,  
14 or the like.

15 The present invention may be embodied in other specific forms without departing  
16 from its spirit or essential characteristics. The described embodiments are to be considered  
17 in all respects only as illustrative and not restrictive. The scope of the invention is,  
18 therefore, indicated by the appended claims rather than by the foregoing description. All  
19 changes which come within the meaning and range of equivalency of the claims are to be  
20 embraced within their scope.

21 What is claimed and desired to be secured by United States Letters Patent is:  
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